THE HEREDITY OF RICHARD ROE

DAVID STARR JORDAN

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THE HEREDITY OF RICHARD ROE

A DISCUSSION OF THE PRINCIPLES OF EUGENICS

BY

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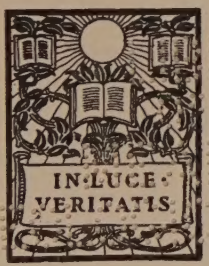

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Look here upon thy brother Geffrey's face;
These eyes, these brows were moulded out of his;
This little abstract doth contain that large
Which died in Geffrey, and the hand of time
Shall draw this brief into as large a volume.

Shakspeare: "King John."

Ever the March of History
Is strewn with cast-off finery
And the Way of Common Things
Is cluttered with the Pomp of Kings.

PREFATORY NOTE

EUGENICS (εὐγένεια, good birth) is the science and the art of being well born. In the words of Francis Galton, who devised the term, it is the "study of agencies that may improve or impair the racial qualities of future generations, either mentally or physically."

The knowledge of the science of Eugenics will sooner or later develop the art. Knowledge will lead to better men. At present, through the agencies of charities which perpetuate the weak, or war which eliminates the strong, and of an education which makes celibacy a condition of success, we are in a degree reversing the processes of natural selection. If the fittest do not serve as parents, the next generations will not inherit fitness.

In the present discussion, Richard Roe, a familiar figure in legal practice, serves as a lay figure of heredity, and in tracing his career some of the leading facts and principles of Eugenics are brought under notice. It may be noted

that a preliminary essay bearing the same title was published in "Footnotes to Evolution" (Appleton, 1898), a volume now out of print.

D. S. J.

Stanford University,
July, 1911.

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THE HEREDITY OF RICHARD ROE

THE HEREDITY OF RICHARD ROE

The Gate of Gifts

When Richard Roe was born, "the gate of gifts was closed" to him. It was in fact closed long before that, at the moment of the blending of the two germ cells (ovum and sperm-cell) from the mingling of which his own personality arose. In the instant of conception, the gifts of life are granted. Nothing more comes of itself. Henceforth he must expect nothing new and must devote himself to the development of the heritage he has received from his father and mother. In this he has a lifelong task. He must bring its discordant elements into some sort of harmony. He must form his Ego by the union of these elements. He must soften down their contradictions. He must train his elements of strength to be helpful to some one in some way, that others may be helpful to him. He must give his weak

powers exercise, so that their weakness shall not bring him disaster in the competition of life. For it is likely that somewhere, somehow, it will be proved that no chain is stronger than its weakest link. Other powers not too weak, nor over strong, Richard Roe must perforce neglect, because in the hurry of life there is not time for every desirable thing. In these ways the character of Richard Roe's inheritance is steadily changing under his hands. As he grows older, one after another of the careers that might have been his, the men he might have been, vanish from his path forever. On the other hand, by steady usage, a slender thread of capacity has so grown as to become like strong cordage. Thus Richard Roe learns anew the old parable of the talents. The power he hid in a napkin is taken away altogether, while that which is placed at usury is returned a hundredfold. He achieves at last, in greater or less degree, "the higher heredity," the fate that each man must create for himself.

Now, for the purpose of this discus-

sion, you, gentle reader, "who are an achievement of importance," or I, ungentle writer, concerning whom the less said the better, may be Richard Roe. So might any of your friends or acquaintances. So far as methods and principles are concerned, Richard Roe may be your lapdog or your favorite horse—or even your *bête noir,* if you cherish beasts of that color. Any beast will do. With Algernon Fitzclarence de Courcy or Clara Vere de Vere, with Sambo or Cæsar the case would be just the same. Let Richard Roe stand at present for the lay figure of heredity—or, if it seems best to you to humanize this discussion, let him be a *man.*

"Almost every one of us," observes Mr. Chesterton, "is a rate-payer, an immortal soul, an Englishman, a baptized person, a mammal, a minor poet, a juryman, a married man, a bicyclist, a purchaser of newspapers, a critic of Mr. Alfred Austin." All this Richard Roe may have been, or he may have diverged at any point but one or possibly two along the line. But whatever and wherever his personal relation, whatever

can be true of anybody may be true of Richard Roe.

And whatever our Richard Roe may be, his nature was fixed by that of his parents. "If we know ourselves well," according to J. M. Barrie, "we know our parents also." This is another version of the old Shinto maxim of Japan: "Let men know by your deeds who were your ancestors."

Richard Roe is himself but "an elongation" or continuation of his parents' life, as Erasmus Darwin said a century ago. He was the elongation of two lives, and behind them, of thousands of others, else he could not have individuality and be really himself. But for all that he is a chip off the old blocks. He is made of many chips from many old blocks.

Thus, as man, Richard Roe enters life with a series of possibilities and tendencies granted him by heredity. Each one is held in some fashion in the mystic nucleus of his first germ cell. Let us examine this series. Let us analyze the contents of this pack which he is to carry through life to the gates of the Golden City.

Inheritance of Humanity

First, from his parents, men and women, Richard Roe has inherited humanity, the parts and organs and feelings of a man. "Hath he not eyes? Hath he not hands, organs, dimensions, senses, affections, passions? fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same winter and summer" as you or I or any other king or beggar we know of? "If you prick us, do we not bleed? if you tickle us, do we not laugh? if you poison us, do we not die? if you wrong us, shall we not revenge?" All this, the common heritage of Jew or Gentile, goes to the making of Richard Roe. His ancestors on both sides have been human, and that for many and many generations, so that "the knowledge of man runneth not to the contrary." If they had been dogs he would have been a dog like them. Even the prehuman ancestry, dimly seen by the faith of science, had in it the potentialities of manhood else it would not have risen to produce him. Descended for

countless ages from man and woman, man born of woman Richard Roe surely is.

We may go farther with certainty. Richard Roe will follow the race type of his parentage. If he is Anglo-Saxon, as his name seems to denote, all Anglo-Saxon by blood, he will be all Anglo-Saxon in quality. To his characters of common humanity we may add those common to the race. He will not be a negro nor Mongolian, and he will have some traits and tendencies not often found in the Latin races of southern Europe. To be sure, Anglo-Saxon is a blend, of course. "Saxon and Norman and Dane are we." But all other races are likewise blends. The Latin stock has many sources. The Mongolian is no single race, and there are as many sorts of negroes as of chickens or of sheep.

Race Characters

But his friends will know Richard Roe best not by the great mass of his human traits nor by his race characteristics: these may be predominant and ineradicable, but they are not distinctive. Many other men on

the street show the same proclivities, and from the rest he must be known by his peculiarities, by his specialities and his deficiencies. Within the narrowest type there is room for infinite play in the minor variations. For almost any possible series of these, Richard Roe could find warrant in his ancestry. His combination of them must be his own. That is his individuality. Hue of the eyes, color of the hair, length of the nose, shade of skin, form of ears, size of hands, character of thumb prints, in all these and ten thousand other particulars some allotment must fall to Richard Roe, and this allotment must be all his own.

Individual Characters

Nature does not repeat herself,—"almost but never quite." She has "broken the die" in moulding each of his ancestors. She will break the die with him. She will make no servile copy of any of her works. By the law of sex, Richard Roe has twice as many ancestors as his father or mother had. Therefore these could give him anything they had severally received from their own

parents. They could give him nothing else. But each one could not give his all, only half at most. The hereditary gifts must be divided in some way, else Richard Roe would be speedily overborne by them. He could not have twice as many qualities as his father. There would be no body left on which to fasten them. The number of traits one man may have cannot be doubled with each succeeding generation. Nature can only double half. Furthermore, any system of division Nature may adopt could only be on the average an equal division. Richard Roe's father might supply half his endowment of inborn characters, his mother furnishing the other half. Nature tries to arrange for some partition like this, but she can never divide evenly, and some qualities will not bear division. Richard Roe's share forms a sort of mosaic, made partly of unchanged characters standing side by side in new combinations, partly a mixture of characters, in part of characters in perfect blending, in part of characters dominant and recessive, the one set evident, the other hidden, to be revived, it may be, in the next generation.

The physical reason for all this the physiologists are just beginning to trace. The machinery of division and integration they find in the germ cell itself—the egg and its male cognate. In all animals, the ripened germ cell, male or female, is not a complete cell. It is only half a cell, with half the nucleus and but half the normal number of chromosomes, or bearers of heredity, which the nucleus of the cell contains. At the instant of conception, these two half cells join, the two nuclei are blended and the result of the union is the complete human cell. From this in the long process of development through cell division, tissue feeding and tissue wasting, Richard Roe at last emerges. At the same time we find that Nature's love of variation is operative even here. She has never yet made two eggs or two sperm cells exactly alike. We use the word "cell" for want of a better one. Each cell is really a centre of energy, a little life battery, for which reason Professor Sachs once suggested the choicer word, "Energide." These little

The Germ Cell

energides are mostly stowed away in cell walls, built of coarser substance. But the real thing is the energy-bearing protoplasm, not the cell walls in which it lies for protection.

Nature can never divide even the simplest structure without getting on one side a bit more than on the other. The germ cell, male or female—and the two are alike in all characters essential to this discussion—is one of the vital units or body cells set apart for a special purpose. All animals and all plants are made up of one cell or of co-operating cells or centres of energy. The germ cell is not in its essence, fundamentally different in structure or in origin. But in its growth it is capable of repeating the whole organism from which it came, "with the precision of a work of art." This the other cells cannot do, at least not in the more complex organisms. A slice of potato will grow into a new potato-plant. A slice of dog will not develop into a new dog. This is because the potato is relatively simple. The dog is more complex, each part dependent on the support of each of the others.

The germ cell is made up of protoplasm, a jelly-like substance, appearing simple, which it is not. It is, in fact, not a "substance" at all, but a structure of gelatinous ribbons and flecks of foam, as complex as anything in Nature. In connection with this structure all known phenomena of life are shown. Inside the germ cell, or in any other cell, is a smaller cellule called the nucleus. Here is the centre of heredity. With the nucleus lies most of the process of inheritance. Its structure in the higher animals is a complicated arrangement of loops and bands, the material of which these are made being called chromatin. This name, chromatin, is given because its substance takes a deeper stain or color (*chroma* in Greek) than ordinary protoplasm or other cell materials.

Protoplasm

The units of chromatin, the loops and bands and curved bodies, we call chromosomes. In each animal or plant these exist in a fixed number. In the more complex organisms the numbers generally run highest.

Chromatin and Chromosomes

With the rest, there is often or always an odd one, a mysterious personage in its microscopic way, whose function is thought by some to be that of the determiner of sex. In the chromatin in some way or other the elements of heredity are contained. In the fertilized egg, the mixed chromatin of the two cells which have been fused into one may be said to contain the architect's plan by which the coming animal is to be built up. The same architect's plan exists in every cell within the body. In the mixed chromatin of the cell which is to grow and to divide, to separate and integrate, till it forms Richard Roe, the potentialities of Richard Roe all lie in some way hidden. How this is we cannot tell. We know that the structure of a single cell is a highly complex matter, more complex than the Constitution of the United States, with a far more perfect system of checks and balances. When we can understand all that takes place in a single cell we shall "know what God and man is." It is not, like the Constitution of our nation, a simple written document with definite

powers and definite limitations. It may rather be compared to the unwritten constitution of civilization. A single cell may hold in potentiality even all that this supposed constitution may embrace. It is not easy, for example, to understand how the possibilities of Richard's tone of voice, or the color of his hair, or his ear for music, or other hereditary qualities can be thus hidden. But so they seem to be and we have to take what we find. Science does not stop even when there is no thinkable answer to her problems.

As we have already said, when Nature is getting the germ cells ready, the hereditary material or chromatin is increased in each one and then again divided and sub-divided, till in the ripened cell but half the usual amount is present. The cell is then ready to unite with its fellow to form a perfect cell, from which, under favorable circumstances, the great alliance of cells which constitute the body of Richard Roe can be built up.

Nature makes her divisions evenly enough, but never quite equally. She is satisfied with an approximate equality, better

satisfied than if she could make a perfect division. She knows no straight lines, she never made a perfect sphere, and she takes the corner away from every angle. It satisfies her desire for likeness to have her children almost alike — never quite. Exact likeness, perfect symmetry would exclude variation, for which she cares still more than for likeness, and for good reason. If her creatures grow up unlike, it is so much easier for her to find places for them in the crowded world of life. Moreover, unlikeness gives play for selection. She can save her favorites and discard her failures. Whenever she divides a cell, she splits each chromosome from end to end. Each nucleus keeps its bit of all that was in the old nucleus.

Nature Divides Unequally

So in the chromatin of his two parents Richard Roe finds his potentialities, his capacities, and his limitations. But latent in these are other capacities and other limitations handed down from other generations before

Atavism

them. These may have been recessive and never guessed at, but they are none the less real. Each grandfather and grandmother has some claim on Richard Roe, and behind these, dead hands from older graves are forever beckoning in his direction. The past will not let go, but with each generation the dust or the crust grows deeper over it. Moreover, these old claims grow less and less with time, because with each new generation there are twice as many competitors. The recessives have twice as hard a struggle to force themselves into dominance. Besides this, as we shall see beyond, these past generations can make no claim on him except through the agency of his own parents. They cannot force on him any direct inheritance.

The Mid-Parent

Out of these elements Mr. Galton frames the idea of a "mid-parent," a sort of centre of gravity of heredity, which in language, not algebra, would represent the same set of ideas. But, as Dr. Brooks has observed, "It may be well to ask what evi-

dence there is that the child does inherit from any ancestor except its parents, for descent from a long line of ancestors is not necessarily equivalent to inheritance from them, and it is quite possible that the conception of a 'mid-parent' may be nothing but a logical abstraction." The parents of Richard Roe were his father and mother, not his grandfather or grandmother, nor yet the whole human race, in one of the chains of which he forms a single link. Recessive qualities are just as truly inherited as dominant ones. When a son inherits his maternal grandfather's beard it is really his mother's beard which he acquires. It is the beard which his mother would have had had she been a man.

Dr. Brooks says: "When the son of a beardless boy grows up and acquires a beard, we may be permitted to say that he has inherited his grandfather's beard; but this is only a figure of speech, and he actually inherits the beard his father might have acquired had he lived; nor would the case of a child descended from a series of ten or a hundred beardless boys be any different."

The species and race characters being the same for father and mother, must be the same for the son. They are added together and divided by two. Half comes from each side in the process of inheritance, but the two halves are alike. But the personal peculiarities recognizable in the father are different from those seen in the mother. The son cannot inherit all from both sources. Certainly not more than half could come from either source, for the new generation could not be built up by the piling on of peculiarities. The old, large, common heritage must always have precedence. Galton has made a calculation, based on theory and confirmed by wide observations, that on the average twenty-five per cent. of the individual peculiarities are directly inherited from each parent. On the average, each parent exerts the same force of heredity. Half the characters come from each, but in each half it would appear that about one-half is lost or rendered unrecognizable by other variation or by contradictory blendings. The first division of qualities in half is necessary and

natural, for there are two parents. The second division in half is an arbitrary assumption which seems to find its warrant in Galton's studies. We might assume without theoretical difficulty a third or a fifth as being preserved intact among possible variations and combinations. One-half, however, seems nearer the fact, and to find the fact is the only purpose of theory. To the characters received from the parents we must add the latent influence of grandparents, great-grandparents, and the long array of dead hands which, however impotent, can never wholly let go. As the smallest wave must go on, in theory at least, till it crosses the ocean, so the influence of every ancestor must go on to the end of the generation. Each of us must feel in a degree the inborn strength or weakness of each one of them. The strength or weakness each has gained for himself he must mostly keep for himself. In this regard each child is freeborn, the founder of a new dynasty. To each grandparent, Galton assigns six and two-thirds per cent. There are four grandparents and two stages of genera-

tion separate them from Richard Roe. Half the force of each, twice lost, seems to give to each grandparent one-fourth the potency in heredity the father or mother has. In the same way, to the great-grandparent we must assign the relation of one and nine-sixteenth per cent. (one sixty-fourth), and so on.

The Thorough-Bred

The "bluer" the blood—that is, the more closely alike these ancestors are—the greater will be the common factor, the less the amount derived from the individual. In perfect thoroughbreedings the individual should have no peculiarities at all. This condition is never reached, but it may sometimes be approximated. In such case the addition of an ancestral sixteenth or sixty-fourth could make no visible change. This may be true among the very bad as well as among the very good. Weakness or badness are more often thoroughbred than strength or virtue. The bluest of blood may run in the veins of the pauper as well as in the aristocrat who boasts that $\frac{1}{2147473648}$ of his ancestral traits came from William the

Norman. In this calculation there is always a bit of residuum left, in which each ancestor back to *Pithecanthropus erectus* of Java, who is the first man we know of, can find his allotted share. And for Richard Roe's own sake, let us hope that he is not too thoroughbred, that he has no record running back too far into the ages. Too narrow a line of descent tends to intensify weaknesses. Vigor and originality come from the mingling of variant elements. Nature does not favor "in-and-in breeding." There is no loss to the individual if decided and different qualities come from father or mother. Contradictory or even incongruous peculiarities are better than no peculiarities at all.

We may imagine, too, that ancestry, like wine, becomes stale, if it remains too long in the sunshine. An ancestry which is readily traced has lived too much in easy places. A few generations of successful dealing with small matters may prepare the way for the power to deal with great ones. Wisdom is knowing what to do next, and wisdom may exist in humble as well as conspicuous fields of action.

Again, at the time of Richard Roe's birth, the character of his father was slowly changing under the reaction toward activity or to idleness, resulting from his efforts and his environment. Whatever it was originally and potentially, it is now no longer so. Changes constantly arise from the experiences of life, the stress of environment, the reduction of "mental friction," the formation of automatic nervous connections or habits, the growth through effort, the depression from involuntary work or voluntary idleness, the decay of vice or disease, the degeneration through the vitiation of nerve honesty caused by nerve depressants or nerve irritants, the deterioration due to spurious pleasures that burn and burn out life by burning its candle at both ends.

Changes Through Experience

Each of these may have come to the father of Richard Roe, and each one had left its mark on him. The fairy's wand and the fool-killer's club each leaves an indelible trace wherever it is used. Through these influences every man is changed from what he

was or what he might have been to what he is. What part of this passes on to Richard Roe? This we may say, that whatever detracts from life may show itself in the next generation, but never in kind. Drunkenness does not involve inheritance of drunkenness. The son of an inebriate may not inherit inebriacy. He may, however, be stricken with epilepsy. Drunkenness for the most part is simply a result of weak mindedness. To inherit weak mindedness may be to fall back into the grasp of drunkenness again. Like conditions produce like results with like people. But it is the weakness, not the drunkenness, the cause, not the effect, which is inherited.

The results of the changes in life, the products of effort, of idleness, of environment, of nurture are known as Acquired Characters. What part have these in Heredity?

Lamarck's "fourth law" of development reads as follows: "All that has been acquired, begun, or changed in the structure of the individuals in their lifetime is pre-

served in reproduction and transmitted to the new individuals which spring from those who have inherited the change." This is the assumed law of Progressive Heredity, the Inheritance of Acquired Character.

Inheritance of Acquired Characters

"Change of function produces change of structure," so Herbert Spencer tells us; "it is a tenable hypothesis that changes of structure thus produced are inheritable."

But though this may be a tenable hypothesis, the opposite hypothesis is thus far much more tenable. It seems to be true that any great weakness on the part of Richard Roe's parents would tend to lower his constitutional vigor, whatever the origin of such weakness might be. If so, such weakness might appear as a large deficiency in his power of using his equipment. It may be, too, that any extreme degree of training, as in music or mathematics, might determine in the offspring the line of least resistance for the movement of his faculties. Perhaps Richard Roe would find mathematics easier had his father devoted his life to exercise of that

kind. But we are not sure that this is so. All observation and all experiment thus far testify against it.

I cannot pretend to say what will be the final decision of science in regard to this vexed question. The balance of scientific opinion at the present is wholly against Lamarck's hypothesis. But if acquired characters are absolutely of no value in heredity, some problems in biology we have thought easy become tremendously complicated. We must rewrite a large portion of the literature of sociology. We must rewrite much of Spencer's Philosophy as well as that of Haeckel. We must give a new diagnosis to Ibsen's Ghosts. We must, in fact, do this in any event, for inheritance such as the Norwegian dramatist pictures it belongs not to heredity at all, but is to be sought for among the phenomena of transmission and nutrition. They are matters of vegetative development rather than of true inheritance. Of the same nature is probably the recurrence of "spent passions and vanished sins" that certain psychologists ascribe to heredity.

Heredity Completes no Character

We must, I think, set aside the inheritance of acquired characters as not being a visible factor in the lives of the higher animals. In one sense, nearly all the characters of the adult are "acquired characters" as distinguished from innate characters. Heredity, for example, does not give to the grown man his characteristics. It gives only the power to acquire them. Just as excessive muscular development requires excessive use of the arm, so average development of any organ is conditioned on an average degree of normal activity. This is a matter of the highest importance if we are to understand the final result in the character and ways of Richard Roe. The color of his eyes is the direct gift of heredity, for he was born with an iris and no effort of his and no neglect could change its color. The leopard cannot change his spots. But the form of his hands was not fixed once for all in the same way. That depends not only on heredity, but most of all on how he uses these hands in after life. The hand of least em-

ployment often has the daintier touch, and this touch is in part the result of the higher heredity which each one works out for himself.

"Blood will tell," we say and say truly, but it is not always clear what it will tell.

Blood Will Tell

We often mistake the bringing up of a child for characters "bred in the bone." The kingly bearing of a king, still more the regal bearing of a queen may be the result of habit, not at all of any innate quality. To be called a king from childhood on makes a boy hold up his head, if he has a head to hold. To be despised of men leads the average man or the average dog to the habit of dodging and skulking. Women above all other people are adaptable. This means that they lie "at the feet of the strong god Circumstance." The proud and haughty among them are so mainly because other people assign them the right to be proud and haughty. Insofar as haughtiness, exclusiveness and incapacity for effort are traits of the conventional "lady," those of the most plebeian

stock will readily qualify, if the training is begun early. Of high or low degree, young women soon adjust themselves to almost any kind of elevation. For this reason, Napoleon insisted that women should have no rank, no recognition as of noble blood, because they are to a large degree the creatures of environment. In this regard men are much like them. For the same reason, then, men should likewise be debarred from hereditary rank, for inherited standing is always a species of farce. It is said that the Czar of Russia has "the brains of a haberdasher's clerk," a role for which nature has doubtless admirably fitted him. That he is emperor of Russia may give him other manners, but it does not improve his brains. Other rulers, as his late majesty of Belgium,

> "One whose crown shed many a pearl
> When his beard was tweaked by a dancing girl"

might have filled successfully the role of bartender or barker at a circus, if Fate had not ordered otherwise. There are other kings who would seem entirely in place as trolley

conductors or as shipping clerks, or might have even risen to the rank of banker or plumber. It was the boast of one prince, I have forgotten his name, that he, at least, of all his family could have earned his living.

Each individual man, clown or king, is the son or daughter of what his father or mother ought to have been. His characters are drawn from his parent's possibilities, not from what these people actually were, still less from what they appeared to be.

Each individual inherits a part of father's and mother's powers, not as finalities but as possibilities, which under like circumstances may arise to like results. Strictly speaking, neither father nor mother gave Richard Roe anything in heredity. Their part is passive. He is a chip of the old block, a mingled chip, but he is like them mainly because he is actually of them. The parents give not what they are at the time with the modifications due to experience, maturity and old age, but the kind of substance of which they are themselves made. This involves the power under similar circumstances

of acquiring these modifications. The power to develop parts harmoniously at all stages of growth gives to the higher animals their actual existence. Thus stomach, appetite, means of securing food and the will to do it must grow and develop together, else the final Richard Roe as animal or man would be impossible.

What Blood Will Tell

The story which blood must tell is further complicated by the fact that our inheritance from one parent is largely negatived by the other. It is said that the tall prefer mates who are short. The solemn and the placid alike welcome the vivacious, and the blonde mates with the brunette. Those characters of the one parent not reinforced by the other drop from dominance to recession. The marriage of two geniuses gives no guarantee or even probability of genius, unless the dominant traits of father and mother are wholly alike in kind. Under our social system, or any other workable system, this is almost never the case. Hence nature, leading towards averages, seems to be striving for me-

diocrity. "Commonness will prevail," as the botanist, De Candolle, says of the abundance of grass. On the other hand, unexpected glories sometimes arise from the happy mating of these common folk whose characters chance to supplement each other. And by the same token, in vigorous nations there are not many really common folk. Each man has some distinction of his own. The commonest of us have had a famous lineage, a brave and hardy ancestry if we only knew it, an inheritance of vigor and persistence else we should not have survived, and a lineage as long as the longest of them and with no doubt an equal show of famous names.

Quality is more likely to be inherited than quantity. The kind of mental or physical quality is more likely to appear in inheritance than the degree. An unusual development of any trait in a parent is likely to be offset by a lack of it on the part of the other parent. This is the basis of the law of Quetelet, the law of the return to averages, the law by which average parentage being the same each generation will produce the same

number of artists, poets, athletes, cowards and rascals. But this phase of the law depends on the continuity of the parental type. If certain kinds of men are cut off, as by war, immigration or celibacy, the next generation will find these types of manhood less fully represented. It has been possible, as shown in the history of Greece and Rome, and, it is said of Paraguay also, for the soldierly type to be almost completely exterminated. The man who is left, in every race, determines its future.

Nature and Nurture

One of the perennial questions in the study of man is that of the relative value of the original endowment as compared with the acquisitions of environment, training and experience. Mr. Galton has summed up these problems in his discussion of "Nature and Nurture." It is clear that Nurture has only Nature to build upon. She can add no new thing. On the other hand, Nature is wholly dependent on Nurture to secure her final results. With adequate nurture, each man becomes what it is in him to

become. Each man creates his own environment having been first created by it. He is "the captain of his fate, the master of his soul," but has to take what is due him as a result of such mastery. There are not many of us who have had ideally adequate nurture. We live up to our possibilities only in part. We are soured and starved and dwarfed by our environment or else through luxury we have lost the stimulus our characters demand. It is said that "woman is one-half poet, the rest what chance of man and marriage may happen to make her." It is much the same with man. The line between success and failure in human life is often a very narrow one, and one which is traversed unthinkingly. It is the fine art of conduct not to make the same mistake twice, and every act is a mistake if it leads to harm to ourselves or to others.

With the lower animals nature is everything—nurture a minor matter. Inadequate nurture means simply destruction of the individual, and that to the species is a trifling incident. With men and with the plants and animals which man has made to depend on

him, and man is himself the most domesticated of all domestic animals, nurture has an ever-growing importance. All our schools, our art, science, religion have their justification as part of our nurture. Still at the end nurture can only develop what was there through nature. Education, training can make nothing new, and neither can leave any traces we can recognize on the germs of life, which show their development in generations to come.

The character of a nation is determined by the character of the people living in it. The character of the people is determined by their heredity, the kind of blood that runs in their veins. Education and opportunity enable the individual to realize himself. Strong people demand education and create opportunity. A good citizen is the man who can take care of himself and has something left over for the common welfare. A man who has no training and who demands none for his children is not a good citizen.

The purpose of the study of Eugenics is to know the kind of ancestors we should pick for the next generation.

We know that all sorts of physical, mental and moral defects are transmitted with fatal precision. We know that quality is more persistent than quantity, general tendencies more persistent than special greatness. We know that "the beaten men of the beaten races," being exploitable, increase the aggregate wealth of the country at the expense of its social unity and of its civic morals.

We know that a nation should be judged by the character of its common men and the degree to which these find or create opportunity. It is not judged by the wealth of its bankers or its captains of industry, nor yet by its art or its science insofar as these are the product or the possession of the few.

Fitness is of many kinds, and all kinds are good. All of us have streaks of unfitness and it is for no man to judge which of these outweighs the other. But we know what it is to be well-born, and to be well-born should be the heredity of every child of the republic. If this generation is well-born, the next will be well taught. When Nature and Nurture work together, we are well on our way to

ideal conditions. But Nurture will do nothing unless Nature is first. Nature indicates possibilities. It is for Nurture to make them good.

Eugenics and Euthenics

Since the rise of the term Eugenics, the contrasting term "Euthenics," (εὐθήτεια, prosperity) has found its place in literature. Euthenics is the sum total of well-being, as contrasted with Eugenics, the sum total of being well-born. No doubt poverty, dirt and crime are bad assets in one's early environment. No doubt these elements cause the ruin of thousands who, by heredity, were good material of civilization. But again, poverty, dirt, and crime are the products of those, in general, who are not good material. It is not the strength of the strong, but the weakness of the weak which engenders exploitation and tyranny. The slums are at once symptom, effect and cause of evil. Every vice stands in this same threefold relation.

To eradicate the symptoms of vice is not to bring about virtue, though it may be

a help. We would not in the least discourage the practice of Euthenics in any of its multifarious benevolent forms. We would only insist on the fundamental fact that good stock is not the product of good surroundings alone. Good stock* is the necessary and, in a large way, invariable product of good ancestry. A good stock is the only material out of which history can make a great nation.

Influence of Birthplace

Somewhere in the good world, Richard Roe was born, and his friends would speak of him as a son or child of that particular place. But this is not fair to Richard Roe, nor is it fair even to his birthplace. For if Richard Roe were an honor to North Cohasset or Eau Claire, let us say, the same town was the birthplace of many who gave it no honor. Cohasset was responsible for neither the one nor the other. Richard Roe was descended, not from the town, but from those who were his actual parents and ances-

* "Es schadet Nichts in einem Entenhof geboren zu sein wenn man in einem Schwanenei gelegen ist."

Hans Christian Andersen.

(No harm to be born in a duck-yard if one has been laid in a swan-egg.)

tors. Cohasset was not made up of these. Among the great men of the last century, Goethe was not typical of Frankfort-on-the-Main, nor Lincoln of Harden County, Kentucky, Darwin was not a son of Shrewsbury, nor Bessemer of Charlton. If Emerson typified Boston, it was to some degree the Boston of which Emerson was a creator. In training and nurture, no doubt, each man was influenced by the ways of his early environment, but from this environment no part of their greatness has arisen. Nathan Rothschild, mightiest of financiers, in whose grasp is still the militant Europe of today, was likewise born in Frankfort-on-the-Main, not far away in time or space from the birthplace of Goethe. While Napoleon was a Corsican, no other son of Corsica is likely ever to turn the world upside down in pursuit of personal ambition. Bismarck was born at Schönhausen, in Prussia, but we do not look to Schönhausen for another iron hand to grip the coming century with the clutch of materialism. Bismarck was the product of an iron lineage, not of the community in which his

parents lived. Richard Roe came over from England with his ancestry. His birthplace was but a temporary camping ground, shared with those of a thousand other lines of descent.

In the heredity of Richard Roe, besides all the intricacies of Nature and Nurture, of Eugenics and Euthenics, we must consider one more factor, which, if it exists, belongs to Nurture and to Euthenics. This is the so-called prenatal influence of the mother.

Prenatal Influences

In the process of evolution the development of the female has brought her to be more and more the protector and helper of the young. She gives to her progeny not only her share of its heredity, but she becomes more and more a factor in its development.

In the mammalia the little egg is retained long in the body and fed, not with food yolk, but with the mother's blood. The "gate of gifts" is not absolutely closed with the process of conception in the same sense as is the case with the lower forms. If the

help of favorable environment can be counted as a gift, this gate is not closed at birth nor so long as the influence of the mother remains. By the growth of the human family the parental environment becomes a lifelong influence. The father as well as the mother becomes a part of it. In Walt Whitman's words:

"His own parents (he that had fathered him and she that had conceived him in her womb and birth'd him),
They gave this child more of themselves than that,
They gave afterward every day, they became part of him."

It has long been a matter of common belief that among mammals a special formative influence is exerted by the mother in the period between conception and birth. The youthful Jacob is reputed to have made a thrifty use of this influence in dealing with the herds of his father-in-law, Laban. This belief is part of the folklore of almost every race of intelligent men. In the translations of Carmen Silva, that gentle woman whom kind Nature made a poet and more or less cruel fortune a queen, we find these words of a Roumanian peasant woman:

"My little child is lying in the grass,
His face is covered with the blades of grass.
While I did bear the child, I ever watched
The reaper work, that it might love the harvests;
And when the boy was born, the meadow said,
'This is my child.'"

In the current literature of hysterical ethics we find all sorts of exhortations to mothers to do this and not to do that, to cherish this and avoid that on account of its supposed effect on the coming progeny. Long lists of cases have been reported illustrating the law of prenatal influences. Most of these records are obviously without value. Some of them are mere coincidences, some are unverifiable, some grossly impossible, and some read like the certificates of patent medicines. There is an evident desire to make a case rather than to tell the truth. The whole matter is much in need of serious study, and the entire record of alleged facts must be set aside to make an honest beginning.

Dr. Weismann ridicules these records and believes that all forms of mother's marks, prenatal influences, and the like, are

relics of mediæval superstition. Other high authorities believe that these supposed influences exist and are occasionally made evident. Doubtless most of the current stories are products of self-deception or plain lying. For example, Dr. Fearn cites the following case: "A mother witnessed the removal of one of the bones (metacarpal) from her husband's hand, an operation which greatly shocked and alarmed her. A short time after, her child was born without the corresponding bone, which was removed from the father."

If this report is true, our ideas of the formation and dissolution of parts of the skeleton must be materially changed. We must believe either that the metacarpal bones are formed just before birth, after all the rest of the skeleton, or else that bones once formed may be reabsorbed under the influence of nervous shock or hysteria. Either view is, of course, absurd. Probably the period of gestation is too short for peculiar nervous states to produce far-reaching changes in hereditary endowments. On the other hand, doubt and ridicule are not argument, and there may be

some reality in influences in which the world has so long believed; but these phenomena, if existing, belong to the realm of abnormal nerve action or of altered nutrition, not to heredity.

Transmission of Impaired Vitality

There are, again, many phenomena of transmitted qualities that cannot be charged to heredity. Just as a sound mind demands a sound body, so does a sound child demand a sound mother. Bad nutrition before as well as after birth may neutralize the most vigorous inheritance within the germ cell. A child well conceived with the best of Eugenics may yet be stunted in development. The many physical vicissitudes between conception and birth may determine the rate of early growth or the impetus of early development. Perfect development demands the highest nutrition or absolute Euthenics, an ideal never reached. In such fashion the child may bear the incubus of Ibsen's "Ghosts" for which it had no personal responsibility. "Spent passions and

Ibsen's Ghosts

vanished sins" may impair germ cells, male or female, as they injure the organs that produce them.

Dr. Woods Hutchinson pertinently observes: "Complex and wondrous and conceited as we are, we are little but carriers of the germ plasms, lanterns to protect from the gusts of circumstances the torch of the life of the race within us. Almost the only way we possibly can affect the next generation is either to starve or to poison, by the toxin of infectious disease or by the external poisons like alcohol or lead, the blood which nourishes the germ cells within our bodies.

"The only hereditary diseases are epilepsy and certain insanities, sick headache and possibly alcoholism. These are really unbalanced or defective states of nerve organization which might be trained to normal vigor or resistance."

We know in these days something of the methods of heredity, "laws" we call them, but a law in nature is simply the co-ordinated record of our experience. In Darwin's words, a law is "the observed sequence

of events," the way things turn out, as we men look at them or try on them our experiments. In these later years we have found that the laws and methods of heredity are essentially the same throughout the organic life of the globe. Man is no exception, and in all regards he takes his chance with the rest. In all respects, the laws of breeding of the higher animals and of man run exactly alike. Whatever is true of the one in heredity is true of the others, and of the lower animals and of "our brother organisms," the plants, each in his degree. "Like the seed is the harvest." And this is the second law, like—but never quite the same. Nature never repeats herself—never quite but ever almost. And that she may never quite repeat herself, each organism among the higher forms represents a double strain, halved and then doubled—the line derived from each of the two parents. The function of sex in nature is primarily to insure variation. From variation, with the survival of the forms best fitted, springs progress,

Laws of Nature

whether of man or of the lower animals. From this demand for variation, in some fashion impressed on the primitive life of the world, arise the forces that hold humanity together.

> Out from the ruthless ages
> Rises, like incense mild,
> The love of the man and the woman,
> The love of mother and child.

The assignment of characters of the parent to the young is not altogether in haphazard fashion, but in many cases, at least, it shows a touch of that mathematics which is the foundation of inorganic nature, but which is rarely traceable in the world of life. In organic nature, a straight line, a right angle, a perfect curve or an involved number is an element which very seldom appears. Quadrupeds have four limbs and insects six, while some flowers have their parts in threes, fours or fives. The leaves on the trees have each a cycle or part of the circumference ranging between one-half to one-third, with a preference for two-fifths or three-eighths, but this does not take us far into the abstru-

sities of mathematics. Heredity sometimes goes a little further.

Mendelism

It happened in the early sixties of the last century, in the city of Brunn, the capital of the Austrian province of Moravia, an Augustine monk experimented in his cloister garden on the rearing of peas. His name was Gregor Johann Mendel, and the discoveries he made are now known as Mendelism, and those plants and animals in which these discoveries can be traced are said to show Mendelian inheritance.

The facts of Mendelian inheritance carry our knowledge farther than the simple proportions laid down by Galton as averages of ancestral inheritance, the fractions $2/4+4/16+8/64+16/256$, the sum of these forever approaching, but never quite reaching unity. Apparently not inconsistent with these, though not traceable in all cases, run the numerical averages of Mendel's peas, and similar averages are traceable in the breeding of guinea-pigs, rabbits, chickens, silk worms, and at times in the breeding of man.

Bateson on Mendelism

The following summary of Mendel's methods and results is condensed from an account given by Professor Bateson. For the purposes of his experiments on the pea, Mendel selected seven pairs of characters as follows:

1. Shape of ripe seed, whether round or angular and wrinkled.

2. Color of the seed leaves, whether yellow or green.

3. Color of the seed skin, whether gray-brown or white.

4. Shape of seed pod, whether simply inflated or deeply constricted between the seeds.

5. Color of unripe pod, whether green or bright yellow.

6. Nature of flowering, whether the flowers are arranged along the axis of the plant or at its tip, forming umbrella-fashion.

7. Length of stem, whether long, (about six feet) or short (about a foot).

Mendel made many experiments in crossing peas which would differ from each

other in some *one* of each of these pairs of characters. It was found that in every case the offspring of the cross exhibited the character of one of the parents in almost undiminished intensity. Intermediate forms not evidently leaning toward one parent or another were not found. These traits are thus held to be unit characters, or characters inherited as a whole without division or blending. In each pair of contrasted characters one prevails over another in each individual of the progeny. The trait which thus prevails Mendel calls the *dominant* character, the other being the *recessive* character.

In all cross-breeding, the existence of such "dominant" (or "prepotent") and "recessive" (or "latent") characters has been recognized as a common phenomenon. The inheritance of recessive characters explains why an individual may "take after" a grandparent rather than a direct parent.

By letting the cross-bred peas fertilize themselves Mendel next reared another generation. In this generation were individuals which showed the dominant character, but

also individuals which presented the recessive character. This fact had been frequently noticed before. But Mendel discovered that in this generation the numerical proportion of dominants to recessives is almost constant, being *as three to one.* With considerable regularity these numbers were found in the case of each of his pairs of characters. There are thus in the first generation raised from the cross-breds seventy-five per cent. dominants and twenty-five per cent. recessives.

These plants were again self-fertilized, and the offspring of each plant separately sown. It next appeared that the offspring of the recessive remained pure recessive, and in subsequent generations never produced the dominant again.

But when the seeds obtained by self-fertilizing the dominants were examined and sown it was found that the dominants were not all alike, but consisted of two classes: (1) those which gave rise to pure dominants, and (2) others which gave a mixed offspring, composed partly of recessives, partly of dominants. Here also it was found that the

average numerical proportions were constant, those with pure dominant offspring being to those with mixed offspring as one to two. Here it is seen that the seventy-five per cent. dominants are not really of similar constitution, but consist of twenty-five which are pure dominants and fifty which are really cross-breds, though, like the cross-breds raised by crossing the two original varieties, they only exhibit the dominant character.

To resume, then, it was found that by self-fertilizing the original cross-breds the same proportion was always approached, namely:

25 dominants, 50 cross-breds, 25 recessives.

Like the pure recessives, the pure dominants are thenceforth pure, and only give rise to dominants in all succeeding generations studied. On the contrary, the fifty cross-breds, as stated above, have mixed offspring. But these offspring, again, in their numerical proportions, follow the same law, namely, that there are three dominants to one recessive. The recessives are pure like

those of the last generation, but the dominants can, by further self-fertilization, and examination or cultivation of the seeds produced, be again shown to be made up of pure dominants and cross-breds in the same proportion of one dominant to two cross-breds. The process of breaking up into the parent forms is thus continued in each successive generation, the same numerical law being followed so far as has yet been observed.

Mendel made further experiments with the common pea, crossing pairs of varieties which differed from each other in *two* characters, and the results, though necessarily much more complex, showed that the law exhibited in the simpler case of pairs differing in respect of one character operated here also.

In crossing plants differing in many different ways, and in crossing animals, we find traces of the same general rules. But very often, as in the hybrid walnuts, the number of possible elements of variation or unit characters is so very great, that we can no longer with certainty trace the Mendelian distinctions. In man, the most complex of

all organisms, we find all degrees of apparent mosaic or blend. Nevertheless, in so far as we are able to isolate a single element or unit character, we find more or less evidence of the existence of numerical relations, similar to those shown in the crosses of the pea. Moreover, it is clear that in every individual, dominant and recessive characters are found, the dominant traits evident in the individual, but perhaps not to appear in the offspring, the recessives not traceable in the individual but recurring, without abatement, in the heredity of his descendants.

The striking feature of Mendel's work is the fact that he has been able to give some degree of explanation why characters are dominant or recessive and to suggest reason for the uniform ratio in which, in simple conditions, we may expect each to appear. This explanation is involved in the idea of "purity of the germ-cells." The units of heredity are mingled in the process of fertilization or "amphimixis," but they do not, any of them, lose in this process any degree of their own individuality.

In the result of a cross-mating, the young may show but one of a contrasting pair of parental characters. This is the dominant or apparent character. Yet when these young develop their own germ-cells, both these parental characters will be represented, not however in every cell, but one of them in any one germ cell. In the case of Mendel's peas, the pollen cells and the ovule cells would carry one or the other type but not both. If this is so, and if the cells be evenly divided as to these characters, then by random mating (according to the law of probabilities) we should have just such results as the experiments of Mendel actually show. Similar records have been shown by experiments with many other plants and animals.

Kellogg on Mendelism

Thus, says Professor Vernon L. Kellogg, "the so-called Mendelian laws of heredity refer to two phases of the problem of inheritance, namely: (1) how inherited characters are actually distributed, and (2) the fundamental cause, lying in the germ plasm, for this particular kind of distribu-

tion. Like Galton's formula, Mendel's law expresses the regularity of heredity based on actual recorded statistics of inheritance; but it also gives a satisfying fundamental reason for this regularity. Biologists, with few exceptions, see in the establishment of the Mendelian principles of heredity in biologic science the greatest advance toward a rational explanation of inheritance that has been made since the beginning of the scientific study of the problem."

Davenport on Mendelian Inheritance

Dr. Charles B. Davenport, in his booklet on "Eugenics," thus emphasizes the practical value of these discoveries of Mendel: "Three fundamental principles are to be kept clearly in mind: (1) the principle of independent unit characters, (2) the principle of the determiner in the germ plasm, and (3) the principle of segregation of determiners.

"The principle of independent unit characters states that the qualities or characteristics of organisms are, or may be analyzed into, distinct units that are inherited inde-

pendently. It follows that the characters of a parent or a particular relative are not inherited as a whole, but each individual is a mosaic of characters that appear in a variety of relations.

"The principle of the determiner in the germ plasm states that each unit character is represented in the germ by a molecule or associated groups of molecules called a *determiner*. These determiners are transmitted in the germ plasm and are the only things that are truly inherited. It is a corollary of the theory of inheritance from the determiner that we do not inherit from our parents, grandparents or collaterals, but related individuals have some common characteristics because developed out of the same germ plasm with the same determiners. A child resembles his father because he and his father are developed from the same stuff. Both are chips from the *same* old block. In relation to determiners some characteristics are positive, depending directly upon them; while others are negative and depend upon the absence of a determiner. Thus a brown eye de-

pends on an enzyme that produces the sepia colored pigment, while a blue eye depends upon the absence of such an enzyme. It is not always easy to anticipate whether a given characteristic is positive or negative. For instance, long hair as in angora cats, sheep or guinea pigs is apparently not due to a factor added to short hair, but rather to the absence of a determiner that stops growth in short-haired animals.

"The principle of segregation of determiners in the germ plasm states that characteristics do not blend. That if one parent has a characteristic while the other lacks it, then the offspring get a determiner from one side only instead of from both sides. When the germ cells are formed in such offspring half of them have the determiner and half of them lack it. There is thus a segregation of presence and of absence of the determiner in the germ cells of the mixed offspring. The characteristic in the offspring that is due to a single (instead of the normal double) determiner is called a simplex characteristic. Such a characteristic is frequently distinguish-

able from one that is due to the double determiner by its imperfect development. Thus the offspring of a pure black-eyed and a blue-eyed parent will have brown eyes.

It is a corollary of the foregoing that if the individual with a simplex character be mated to one lacking this character, half of the offspring will lack the determiner and half will be simplex, again, in respect to the character. If in both parents the character be simplex, then two like determiners will meet in one-fourth of the unions of egg and sperm, the two will both be absent in one-fourth of the unions,—such will be simplex again. If one parent have the characteristic simplex and the other duplex, then half of the offspring will have it simplex and half duplex.

Starting with the principles just enunciated we reach at once the most important generalization of the modern science of heredity:—*When a determiner of a characteristic is absent from the germ plasm of both parents* (*as proved by its absence from their bodies*) *it will be absent in all of their off-*

spring. In order to predict the result of a particular mating it is necessary first to know what similar unit characteristics both the parents lack, what they both possess and in which characters they differ, and, secondly, to know for each characteristic whether it is due to the presence of a determiner or to its absence. This can, in part, be determined experimentally or it may be inferred from pedigrees. Nevertheless our knowledge of determiners progresses slowly; for here, as in other branches of science, nature's secrets have to be forced from her.

"To illustrate the precision with which the characteristics of offspring may be predicted in the best studied cases, I may refer to eye color. Blue eyes are due to the absence of brown pigment. If there is a determiner for brown iris pigment in the germ plasm it will produce such pigment in the body that arises from that germ plasm. The absence of iris pigment is proof of the absence of the pigment determiner from the germ plasm. If both parents lack brown pigment, their offspring, being devoid of the de-

terminer for brown pigment, will all lack brown pigment. As a matter of experience two parents both with pure blue eyes will have only blue-eyed offspring. Similarly, if the hair of the parents be flaxen, that is evidence of the absence of a hair-pigment determiner in their germ plasm. In the united germ plasms of two flaxen-haired parents there is no determiner for hair pigment, and all children will have flaxen hair. This agrees, again, with experience. For the same reason parents both lacking curliness or waviness of hair will typically have only straight haired children.

"Hair and eye color are characteristics which serve well to illustrate the precision of the modern science of heredity, but they are ordinarily considered to be immaterial to well-being. But if it is true, as Major C. E. Woodruff maintains, that pigmentation protects individuals from the injurious effects of the tropical sun's rays, then one may say that the marriage of two blue-eyed persons in the tropics would be an unfit marriage. On the other hand, the marriage of a blonde with a

brunette would be fit, for the darker consort would bring into the combination the determiner for pigment and ensure a dark progeny. In the tropics, then, the marriage of light with dark or of two dark persons is, by hypothesis, a fit mating while that of two blondes is unfit."

If the statements of Bateson and Davenport should seem hard reading the fault lies with the facts themselves, which are hard thinking. So elaborate an organism as Richard Roe was not built up in a day nor a generation nor a century of centuries. The huge complex of orderly change and progressive adaptation to conditions which we call organic evolution is the one unified concentrated marvel of the Universe. And even Mendelism does not explain all nor nearly all of the phenomena of inheritance. It deals with certain simple characters which seem to be transferred as a whole,—the yellow of peas, the short hair of guinea pigs, the white and yellow of the web of silk-worms spinning, the dark color of the iris and simple units in heredity.

Last Word on Heredity Unsaid

But in the more complex traits of Richard Roe we find a degree of blending and of overlapping which it is often beyond our power to analyze or to explain. In his family affairs we find inconsistencies, and we catch glimpses of principles which cross the Mendelian principles at various angles and which show us that the last word on heredity is not yet said and may not be said for centuries to come. The blended inheritance, as that of the mulatto, when the characters of two races or species are inextricably mixed, has not yet yielded to Mendelian analysis. The ordinary mosaic, in which unchanged characters from either parent exist side by side in the young, as in Goethe's poem, "Vom Vater hab' ich die Statur," is more readily reconciled with the Mendelian experiences.

While in a few individual traits we may recognize ourselves as dominants or recessives, in ten thousand others we belong midway with the cross-bred, and our fathers and our mothers were in the same condition. It is only when like mates with like that the

Mendelian conditions appear clearly in our inheritance.

Goethe thus describes his own heredity:*

"Stature from father and the mood
Stern views of life compelling;
From mother I take the joyous heart
And the love of story-telling.

"Great-grandsire's passion was the fair,
What if I still reveal it?
Great-granddam's, pomp and gold and show,
And in my bones I feel it.

"Of all the various elements
That make up this complexity,
What is there left when all is done,
To call originality?"

And in like manner and with like failure in originality, you, my gentle reader, are built up, and likewise Richard Roe and all the rest of us, with here and there many dominants in plain view, and many recessives fortunately or unfortunately hidden, with here and there a fragment of the simple

* Goethe's Zahme Xenien VI. This translation is, in part, that of Bayard Taylor.

Mendelian order, traceable in the lowlier lives of guinea pigs and peas.

In all this we have dealt with the possibilities of Richard Roe viewed simply as the sexless embryo, the joined protoplasm and united chromosomes of the two parent germ cells. This germ has now to grow and expand by cell division. But besides its vegetative growth two possible lines of development lie before it, one of which it must take. It must assume sex. It must become either male or female. It is so written in the book of fate. The choice of the one at the critical time is as feasible as that of the other. There are in the long run as many men as women in the world, as many females as males in almost every species. But once made, the choice is irrevocable. Thus far man has found no way to control this choice and Nature makes it for him. The sexless embryo is, as it were, suspended on a hair, to be turned to male or female by the first stimulus which may reach it. Or if, by chance, the embryo is not really sexless and the determi-

Determination of Sex

nation lies in the nature of the germ cell itself—some male, some female by structure of protoplasm or maybe through the structure of the one odd chromosome,—this, too, turns on the weight of a hair and we know no way to control or to modify it. But whatever the determinant, in the human race, the germ cell can be reached only through the mother. How sex comes, no one has yet actually found out.

It has long been known that with certain insects and crustaceans full nutrition increases the number of females; starvation of the mother gives more males among the young. It might be so with the human race, but it probably is not. In any event, experiments do not seem to bear out the theory. The prescription of a proteid diet to produce males and a fatty diet for females has been relegated to the realm of quackery. Many other suggestions have been made which need not be discussed here, for they seem to be all equally futile. In general we may say that the determination at will of sex in offspring is not theoretically impossible. But the ele-

ments involved are too obscure and complex for certainty to be probable. It is, moreover, an open question whether the general diffusion of such power would be a boon to mankind.

In any event, Richard Roe became male. Whether *vir* or *homo,* real *man* or male human being, is another question. This rests with heredity on the one hand and with environment on the other. But between the one and the other enters the fact of sex. Whatever the cause, whether resident in the germ cells or not, whether due to nature or to nurture, need not concern us now. The fact of masculinity becomes more and more dominant as his growth goes on. At last it affects all his activities, modifies all his structures, and permeates every fiber of his being. Then is Richard Roe a *man,* and our formula of his possibilities is modified by that overshadowing fact. But his heredity characters are arranged and assigned before the question of his sex is determined by nature.

This sum of his possibilities may be formulated as follows: Richard Roe has the sum

of species characters: race characters; one unequal fourth of father's peculiarities; one unequal fourth of mother's peculiarities; one-sixteenth of paternal grandfather's peculiarities; one-sixteenth from maternal grandfather; one-sixteenth from each grandmother; one sixty-fourth from each great-grandparent, etc.; an unknown and certainly negligible part of the gain through the father's activity; an unknown and negligible part of gain through the mother's activity; an unknown part, fortunately also negligible, of loss through the idleness or non-development of each; an unknown and doubtful change through prenatal influences received through the mother; the whole reduced by untoward influences many or few arising from transmission or failure in early nutrition, and to be modified in every part by the fact that he is a man.

Final Formula of Heredity

But these fractions indicate only potentialities. These make up the architect's plan on which Richard Roe is to be built. The plan admits of much room for deviation.

Every wind that blows will change it a little. These elements themselves are of varied character. They do not belong together nor are they held in place, so far as we know, by any "ego" except that made by the cell alliance on which they depend. Some of these elements the experiences of life will tend to reduce or destroy. Some of them will be systematically fostered or checked by those who determine Richard Roe's early environment. The final details will be beyond prediction. The *ego* or self in the life of Richard Roe is the sum of his inheritance, bound together by the resultant of the consequences of the thoughts and deeds which have been performed by him and by others also. Thus each day in his life goes to form a link in the chain which binds his conscious processes together. The "vanished yesterdays" are the tyrants of tomorrow. The higher heredity is the heredity from ourselves.

Potentialities not Character

The art of life is in a large degree the process of "holding one's self together." The

ego is the expression of the result of this process. Just as "England" exists only as the co-operation of all Englishmen, so does the mental "ego" exist only in the co-ordination of working nerve cells. The theory that the ego is a separate being which plays on the organs of the brain as a musician on the keys of a piano belongs not to science but to poetry. As well think of England as a disembodied organism that plays on the hearts of Englishmen, leading them to acts of glory or of shame. This, too, might be poetry; it is not fact.

The Higher Heredity

The unity of life, which is its sanity, depends on bringing the various elements to work as one force. Duality or plurality in life, the "leading of a double life" of any sort, is an evidence of some kind of failure or disintegration. "Science finds no ego, self, or will that can maintain itself against the past." In other words, from the past, its inheritance and its experience, the elements of the present are always drawn. The con-

The Unity of the Ego

sciousness of man is not the whole of man. It is not an entity working among materials foreign to itself. It is rather the flame that flickers over embers set on fire long before and whose burning may go on long after the individual flame has ceased to be.

The personality of Richard Roe is a result of co-operation of his parts. His self-consciousness arises from the working together of his higher nerve cells. That it arose from many, not from any particular one, gave it in some degree the semblance of being apart from them all. But this was only a semblance, and the elements of which his personality was made had been used before him by many others.

The Ego A Corporation

With all this, we may be sure that the stream of Richard Roe's life will not rise much above its potential fountain. He will have no powers far beyond those some of his ancestors possessed. But who can tell what powers have remained latent in these ancestors? It takes a series of peculiar circumstances to bring any group of qualities into

notice. Those men who are famous in spite of an unknown ancestry are not necessarily very different from this ancestry. Fame is a jutting crag which may project from a very low mountain. Far higher elevations may not catch the eye if their outline is not unusual. Even under the plebeian name by which "Fate tried to conceal him," Richard Roe may receive a noble heritage. Doubtless it may be passed on to the next generation, not the less noble because it has not been exposed to the distortions of fame. Real greatness is as often the expression of the wisdom of the mother as of anything the father may have been or done. As society is now constituted, the great hearts and brains of the future may be looked for anywhere. They will not fail to come when needed, and in most cases they will appear unheralded by ancestral notoriety, but never without ancestral force.

Fame Not Greatness

Francis Thompson wisely observes: "Constant intermarriage within the limits of a patrician class begets effete refinement. To

reinvigorate the stock, its veins must be replenished from hardy plebeian blood." He is speaking of patrician words, or words sanctioned by poetic usage, but his figure of speech is drawn from the facts in human life.

The Mother's Part

As a rule, the mother in the household remains concealed from the illuminations of fame. In the register of society, even her name tends to vanish. But her part in heredity is not less than that of the father. Her part in the higher heredity, the character each man works out for himself, is even greater. In spite of the facts of race-suicide, and the numbers of foolish wives and broken families, motherhood was never so highly esteemed in civilized races as it is to-day. Never were women so well fitted for their obligations for duties which do not cease with child-bearing, but continue through the noble degrees of child-rearing and lifelong sympathy and friendship.

The modern freedom and the training of women are elements which make them wiser and stronger and more competent as

human beings, and therefore as women also. The "gilded youth" and the "smart set" are not typical of American manhood or womanhood and Richard Roe is not of their kind, for he belongs to a type that lasts.

Self-Mastery

In the beginning Richard Roe is the helpless product of the forces which called him into being and of the instincts and functions inherited with this helplessness. But once established on the earth, he becomes more and more "the captain of his fate, the master of his soul," until waning manhood shall reduce him again to childish inefficiency. But through all the struggles by which he builds up his character and life, he must act with the tools his ancestors have given him and with these only. It is too late to give him better tools, but his failures may be a help to his descendants. He may develop from them some formula by which these may be well born, his sons through life competent for the duties of manhood, or his daughters adequate for the responsibilities of womanhood.

And out of this thought has grown up

the science and the art of Eugenics, the science and art of being well born. He is well born who comes of good stock. He is twice well born if his combinations work toward well-balanced and effective ends, measuring the value of life by health, happiness and effectiveness in action.

Eugenics

We cannot help ourselves in this regard, but we may look towards the future and help the next generation. Many investigations have been made of the conditions of wise mating, and we have many records of these conditions which insure unhappiness and ineffectiveness in the generations to follow. The pedigrees of strong men have been traced that we may know how to explain their strength. We have also the pedigrees of the dissolute, the feeble-minded, the idle, the defective. We find in these that evil and weakness rarely originate *de novo,* but that they are handed down as a baneful legacy from generation to generation.

There are many conditions which lie outside of heredity which may render a person,

otherwise acceptable, unfit for the high office of parenthood. To have one's tissues infected with the venomous little parasitic organisms, plant or animal, which cause the disease known as syphilis, is to ensure the permanence of the same disease in mother and in offspring. It is not a matter of heredity. The germs of the minute organism *Spirochæte* are borne in the blood and permeate the tissues, dissolving the capillary walls, and causing the death in life of mother and child. Scarcely less destructive, though less reeking in venom, is the plant *Gonoccocus*, the other agent of the Red Plague, the potent cause of sterility, of infant-blindness, of the incompatibilities of life which find eruption in the divorce courts.

Parasitic Diseases

Dr. Charles B. Davenport has well said: "Governments spend scores of thousands of dollars and establish rigid inspections to prevent the spread of the coitus disease of the horse, but the *Spirochæte* parasite that causes the corresponding disease in men and entails endless misery on

Davenport on the Red Plague

hundreds of thousands of innocent children may be disseminated by anybody, and is being disseminated by scores of thousands of persons in this country, unchecked, under the protection of the 'personal liberty' flag. Alas! that so little thought is had to the loss of liberty of the infected children. Marriage of persons with venereal disease is not only unfit, it is a hideous and dastardly crime; and its frequency would justify a medical test of all males before marriage, innocent as well as guilty. Fortunately there exists for syphilis at any rate a test so simple that there can be no more objection on any sentimental ground to it than to vaccination."

Effects of Alcoholism

The various effects of drugs belong to Euthenics rather than to Eugenics, for apparently they have no direct relation to heredity. Experience shows that the use of alcohol or any other nerve-affecting drug in extreme degree is often accompanied by defective offspring. But as to the relation of cause and effect, there is doubt in each individual case. Alcoholism is often in itself evi-

dence of feeble-mindedness. It may be at once cause, effect and symptom. Whether the use of alcohol injures the germ-cells and impairs their development, whether an alcoholic environment is one which limits the normal strength of youth, or whether one or all of these evil influences may exist in the individual case, is generally an open question. There is no question as to the injury to the individual in the continuous use of the nerve depressant, alcohol. Dr. Cushny, the London pharmacologist, truly observes that "if alcohol were a new synthetic drug imported from Germany and a few cases of alcoholism had been discovered as resulting from it, there would be such an outcry against it that it would be forever prohibited. A much more valuable drug, cocaine, has nearly come to this fate on account of a few isolated cases in which the cocaine habit has been formed." But the relation of alcohol to heredity is as yet far from clear. It would appear that alcoholism as such is not inherited, at least not as "alcoholism." The mental and moral defects in which inebriety rests

may be inherited, like causes producing like results in succeeding generations. Or alcohol or other drugs may so disorganize the nervous system that sound offspring may become impossible. In such case, the inheritance would more likely take such a form as that of epilepsy.

This we may assume in all cases: "Every abnormal condition is induced by something." Normal parents do not produce abnormal offspring. When a child is half-witted or epileptic, for example, unless the condition be the direct product of disease, we may look for imbecility somewhere in its ancestry. In the words of Davenport:

"That imbecility is due to the absence of some definite simple factor is indicated by the simplicity of its method of inheritance. Two imbecile parents, whether related or not, have only imbecile offspring. Barr gives us such data as the following from his experience. A feeble-minded man of thirty-eight has a delicate wife who in twenty years has borne him nineteen defec-

Davenport on Feeble-Mindedness

tive children. A feeble-minded epileptic mother and an irresponsible father have seven idiotic and imbecile children. The "L." family numbers seven persons, both parents and all five children imbecile. Among the 'family records' I have been collecting there occurs the "R." family where "A" (insane) marries in succession two mentally weak wives and has thirteen children, all mentally weak. In a case described by Bennett, a defective father and imbecile mother have seven children all more or less mentally and morally defective. There is, so far as I am aware, no case on record where two imbecile parents have produced a normal child. So definite and certain is the result of the marriage of two imbeciles, and so disastrous is reproduction by an imbecile under any conditions, that it is a disgrace of the first magnitude that thousands of children are annually born in this country of imbecile parents to replace and probably more than replace the deaths in the army of about 150,000 mental defectives which this country supports. The country owes it to itself as a

matter of self preservation that every imbecile of reproductive age should be held in such restraint that reproduction is out of the question. If this proves to be impracticable then sterilization is necessary—where the life of the state is threatened extreme measures may and must be taken."

Davenport continues: "While the acquisition of new data is desirable, much can be done by studying the extant records of institutions. The amount of such data is enormous. They lie hidden in records of our numerous charity organizations, our 42 institutions for the feeble-minded, our 115 schools and homes for the deaf and blind, our 350 hospitals for the insane, our 1200 refuge homes, our 1300 prisons, our 1500 hospitals and our 2500 almshouses. Our great insurance companies and our college gymnasiums have tens of thousands of records of the characters of human blood lines. These records should be studied, their hereditary data sifted out and properly recorded on cards, and the cards sent to a central bureau for study in order that data should be

placed in their proper relations in the great strains of human protoplasm that are coursing through the country. Thus could be learned not only the method of heredity of human characteristics, but we shall identify those lines which supply our families of great men: our Adamses, our Abbotts, our Beechers, our Blairs, and so on through the alphabet. We shall also learn whence come our 300,000 insane and feeble-minded, our 160,000 blind or deaf, the 2,000,000 that are annually cared for by our hospitals and Homes, our 80,000 prisoners and the thousands of criminals that are not in prison, and our 100,000 paupers in almshouses and out.

"This three or four per cent. of our population is a fearful drag on our civilization. Shall we as an intelligent people, proud of our control of nature in other respects, do nothing but vote more taxes or be satisfied with the great gifts and bequests that philanthropists have made for the support of the delinquent, defective and dependent classes? Shall we not rather take the steps that scientific study dictates as necessary to dry up the

springs that feed the torrent of defective and degenerate protoplasm?

"Greater tasks than those contemplated in the broadest scheme of the Eugenics committee have been carried out in this country. If only one-half of one per cent. of the 30 million dollars annually spent on hospitals, 20 millions on insane asylums, 20 millions for almshouses, 13 millions on prisons, and 5 millions on the feeble-minded, deaf and blind were spent on the study of the bad germplasm that makes necessary the annual expenditure of nearly 100 millions in the care of its produce, we might hope to learn just how it is being reproduced and the best way to diminish its further spread. A new plague that rendered four per cent. of our population, chiefly at the most productive age, not only incompetent, but a burden costing 100 million dollars yearly to support would instantly attract universal attention, and millions would be forthcoming for its study as they have been for the study of cancer. But we have become so used to crime, disease and degeneracy that we take them as necessary

evils. That they were, in the world's ignorance, is granted. That they must remain so is denied."

If Richard Roe by chance is a defective, unable by heredity to rise to the level of helpfulness and happiness, it is not a wholesome act to help him to the responsibilities of parenthood. It is a wise charity to make him as comfortable as may be with the assurance that he shall be the last of his line.

And because the evolution of man may lead downward as well as upward it is well to look for a moment at the questions involved in human degeneration.

Degeneration

By degeneration is meant the process by which a living being changes for the worse. This implies a narrowing range of powers and capabilities. The word is opposed in meaning to change for the better, which we call progress or development.

Throughout the animal and vegetable kingdoms may be found instances of degenerate types. There are species or groups of species which have declined in complexity of

structure and range of activities as compared with their ancestors. Degeneration of type appears whenever the range of competition is narrowed or incentive to activity lessened. It takes place whenever a relaxation of the struggle for existence permits life on a lower plane of activity or with less perfect adaptation to conditions. Thus a land animal transferred to the sea has its range of activity narrowed. There is competition from fewer quarters, and a corresponding decline of competitive structures takes place, with the intensification of those functions and instincts which deal especially with marine life.

Decline in Range of Activities

The most striking cases of degeneration are those of quiescent animals, and parasitic animals and plants, as compared with their free-swimming, self-dependent ancestors. Examples of degenerate quiescent animals are the Tunicates. These creatures, descended from fishlike ancestors, are for the most part reduced to motionless sacs, buried

Quiescent Animals

in the sand or anchored to rocks or wharves. The evidence of their origin is found in the fact that the young Tunicate is tadpole-shaped, with a rudimentary backbone, and has the motions and in large degree the structure of the fish. With the loss of power of locomotion the structures on which locomotion depends also disappear.

Still more marked is the degeneration of parasites. It is a universal rule that all creatures dependent on others for support lose their power of self-help. Parasitic insects lose their wings and are confined to the bodies of those unwillingly made their hosts. Parasitic worms are the simplest of their kind. Insects feeding on the juices of plants which they suck without moving become reduced to mere living scales.

Parasitic Animals

Perhaps the most remarkable example of the degeneration of parasitism is that seen in the crustacean called Sacculina. This creature appears as a simple sac attached to the body of the crab, into which its root processes or

Sacculina

blood vessels extend. When it is hatched from the egg it is similar in form to a young crab, independent and free-swimming. It soon attaches itself to some adult crab, into the body of which it extends its processes. It loses its power of locomotion, and the limbs all disappear. Living at the expense of others, self-activity is not demanded, and its position protects it from competition to which free-swimming crabs are subject. It becomes degraded into a parasitic sac, with no organs except a nervous ganglion, the ovaries, and root processes. This is the female Sacculina, and parasitic upon this is the smaller and still more degraded male of the same species.

Animal Pauperism and Human Pauperism

The Sacculina is the type of race degeneration among animals and plants. When the stimulus to individual activity is lowered and the conditions of environment are such that destruction does not follow reduced activity, we have continuous degeneration. This is the condition of animal pauperism. It is the survival of the most reduced. The same general laws hold good

among men. Inactivity and dependence, protection in idleness, bring about deterioration and end in weakness, incapacity and extinction.

It is true that all advance in one structure implies degradation of some other. This is the so-called "law of compensation." The specialization of the human hand, for example, has been at the cost of the human foot. The power to live by his wits has taken from man something of the strength and spryness of his apelike ancestors. Any organ tends to degenerate when its highest function loses importance or is replaced by some other. To have one's food cooked means the reduction of the lower jaw and its muscles. For a bird to trust to its wings means the decline of the strength of its feet. Reduction of unused parts is a universal rule in organic development. Decline in all parts is the essential meaning of degeneration.

Law of Compensation

As commonly used, this word degeneration has many different meanings, and often no meaning at all. A degenerate race is a race

which has lost its best elements, by war or emigration or other causes, which lead it to breed chiefly from its worst examples. There is no such thing as collective race degeneration. The best are not harmed directly, because the weak survive. It is only the average which can be lowered. Like the seed is the harvest. Heredity runs level on the average. She repeats what she finds. When she finds a weakened stock after a great war, she makes use of this stock to continue her population, of a lower type. With men as with animals it is always that which is left which determines the future of the race or breed. Selection is the main element in racial change, and selection is reversed whenever the strong are marked for destruction and the weak are allowed to survive.

Race Decline not Collective

Any group of men gains or progresses with the struggle for opportunity, with education, with training, with the combined influences of art, science and religion. These matters involve no element of heredity. They touch only the individual life.

These are matters of Nurture, of Euthenics. Race improvement, very slow at the best, and concerned only with averages, can rest only on selection. Race-decadence, equally slow and equally a matter of averages, can come only from reversal of selection. No race ever rose or fell as a whole. When the Romans were almost exterminated by continuous war, there were still Romans as noble as in the days of Cincinnatus or of Junius Brutus. The glory of a nation is no sign that the average strength of its people is not failing. The actual condition of a nation is not judged by its wealth, by its universities, its arts or science, still less by its military pomp or prestige. The final test of any nation is in the opportunity it gives its average man and still more in the fitness of the average man to grasp this opportunity. William Allen White observes: "The trash heaps of history are piled high with nations that were cruel to those who did their rough work. The land that cheats its workers cheats itself."

When nations decree that the best use of the common man is to make him "food for

powder," "chair pour le canon," in Napoleon's phrase, national glory is but another name for national weakness.

As the destruction of the unadapted is the chief element of race progress, so is the survival of the weak the chief element in race decline. Race-decadence occurs when the strong are withdrawn without posterity, when weakness mates with weakness, when incentives to individual action are taken away, without reduction in security of life, and when the unfit are sheltered from the consequences of their folly, weakness or perversity. The increased effectiveness of altruism which goes with race progress furnishes a shelter under which race decay goes on. The growth of wisdom makes folly safe. At the same time the growth of wisdom works the death of fools when they are brought into life-and-death competition with those stronger and wiser.

In the open competition of life the lineage of degeneracy is a short one. Each individual man is a link in the chain of life. His intellect is its guardian. If the safe-

guard is weak, the link will be broken. Under ordinary conditions of freedom there is no such thing as bad heredity. Our ancestors are sound and sane each in a fair degree, else we should not have seen the light.

Withered Branches

But with all this the withered branch may occur on the most vigorous trees. Some descendant will show defects in nervous system or in balance of qualities. He will develop weakness or excess in sensitiveness or in motor response, or his mental operations will show a lack of that accuracy we call common sense. Such conditions, if inborn through germ variation, may become hereditary.

Old Age

It is the fate of Richard Roe that he shall rise through the various stages of life, as embryo, child, youth, man, with the final end of weakness and death. The personal degeneration of old age no man has learned to avoid, and no one has yet found his way to preserve his alliance of cells from the final disintegration which spreads from his weak-

est organ. Old age brings nerve decay and organic failure to the strongest man at last. The wisest finds at last his second childhood. This may come prematurely under conditions which wear out life too rapidly. These influences which waste life are manifold, and it is part of the fine art of living to avoid them.

Race Decadence

The decline of races is going on at all times and co-incident with race progress. Which force may have the upper hand at any time is a matter of average, and an average decline in manhood may be accompanied by a rapid advance in the arts of civilization. This means that the race is splitting into castes. The strong are separating from the mass, the rich growing richer while the poor are plunged farther into poverty.

Charity

Unfitness in any race may be preserved through charity. "Charity," says a French writer, "causes half the suffering she relieves, but she can never relieve half the suffering she causes." Unwise charity is responsible for half the pauperism of the world. That pau-

perism has become perpetual is due in part to the charity that, in aiding the poor, helps pauperism to mate with pauperism. It is the duty of true charity to remove the causes of weakness and suffering. It is equally her duty to see that weakness and suffering are not needlessly perpetuated.

The Crétins of Aosta

Startling results may follow from the selective breeding and preservation of paupers. In the valley of Aosta, in northern Italy, and in other Alpine regions is found the form of idocy known as *crétinism*. What is the primitive cause of the *crétin*, and what is the causal connection of *crétinism* with goître, a disease of the thyroid glands which always accompanies it, no one clearly knows. The goître is caused by some condition of nurture, of housing, food or water. The goître in children causes idiocy. It is relieved or cured when taken early by small doses of iodine.

It suffices for our purpose to notice that the severe military selection which ruled in Switzerland, Savoy, and Lombardy for many generations took the strongest and healthiest

peasants to the wars, and left the idiot and goîtrous to carry on the affairs of life at home. To bear a goître was to exempt from military services. It is said that when iodine lozenges were given to the children of Savoy in the hope of preventing the enlargement and degeneration of the thyroid gland, mothers would take this remedy away from the boys, preferring the goître to military service.

In the city of Aosta the goîtrous *crétin* has been for centuries an object of charity. The idiot has received generous support, while the poor farmer or laborer with brains and no goître has had the severest of struggles. In the competition of life a premium has thus been placed on imbecility and disease. The *crétin* has mated with the *crétin*, the goître with the goître, and charity and religion have presided over the union. The result is that idiocy is multiplied and intensified. The *crétin* of Aosta has been developed as a new species of man. In fair weather the roads about the city are lined with these awful paupers—human beings with less intelligence than the goose, with less decency

than the pig. The asylum for *crétins* in Aosta is a veritable chamber of horrors. The sharp words of Whymper are fully justified:

"A large proportion of the *crétins* who will be born in the next generation will undoubtedly be offsprings of *crétin* parents. It is strange that self-interest does not lead the natives of Aosta to place their *crétins* under such restrictions as would prevent their illicit intercourse; and it is still more surprising to find the Catholic Church actually legalizing their marriage. There is something horribly grotesque in the idea of solemnizing the union of a brace of idiots, and, since it is well known that the disease is hereditary and develops in successive generations, the fact that such marriages are sanctioned is scandalous and infamous."

True charity would give these creatures not less helpful care, but a care which would guarantee that each individual *crétin* should be the last of his generation.

This I wrote in 1897. I let it stand, though it is no longer true. In his charming volume, recently published, on "The Valley

of Aosta," Felice Ferrero uses the following language:

"The *crétins* of the valley of Aosta make a miserable spectacle, it is true; more so than is necessary, as many roam freely in the villages and importune strangers, begging with the most obdurate insistence, and forcing into evidence their horrible bodies. The evil is, however, being partially remedied by corralling the unfortunate creatures in institutions, where they are decently taken care of.

"Crétinism is an old plague in the Alps. It is said to have been known in ancient times, and was described at length in the seventeenth century; but although numerous physicians have since studied the disease, made experimental researches and trials *in corpore vili,* its cause is almost as much of a mystery as in centuries past. The only certain data about it are the following: that crétinism belongs exclusively to mountainous districts (although not necessarily in the narrowest valleys); that it is connected with goître (although goîtrous people are not necessarily

crétins); that it is connected, like goître, with the atrophy of the thyroid gland; that it is transmitted by heredity. Beyond this not much is to be gathered, although the literature on the subject is extremely abundant. In 1867 a diligent investigator collected as many as forty-two causes assigned for it: the lack of light and air, the temperature, the vegetable diet, the use of pork, alcoholism, intermarriage, the nature of waters and air, and what not else besides! One official document seriously advances the theory that sin is the cause of the malady, and that confession and the *Brautexamen* would be good remedies; in which one may, if he will, see a deeper truth under the theologic expression. . . . But so far there is not much definite and conclusive material to rely upon; the *crétin* still wanders aimlessly about, emitting uncanny sounds from his distorted mouth, a clouded intelligence in a useless body—a horrible example of the miseries that flourish by the side of the divine glory of the great mountains."

I visited Aosta in 1881, in 1883, and again in 1900, verifying in full the state-

ments of Whymper and of Ferrero. In these years, *crétins* were seen on the streets everywhere and on the roads which lead out of Aosta. Everywhere were these feeble little people, with silly faces and sickening smile, incapable of taking care of themselves and all disfigured by the goître at the neck. Not every person with the goître is an idiot, but every idiot has the goître. People of these two classes are excluded from mating with healthy people, and both are excused from military service. With the loss of the normal man killed in battle, leaving the weak at home, the relative number of goîtres and of idiots has steadily increased.

In 1910, I visited Aosta for a further study of this question. To my surprise I was unable for some time to find a single *crétin* or even anybody who knew the meaning of the word. I found that some twenty years ago Aosta had built an asylum for the aged poor (*i poveri vecchi*). All the *crétins* and most of the goîtrous in this region have been removed to this asylum, the men segregated from the women and the inmates not allowed

to marry. There is but one *crétin* left, an old woman four feet high, who has the intelligence and, for that matter, the manners of a lap dog, very affectionate, but without any mental capacity. There were also three others, half *crétins*, illegitimate children of *crétin* women. As regards the *crétin* children, Suor Lucia, the Mother Superior, said simply: 'Il n'y en a plus' (They don't come any more).

I visited the orphan asylums. Every child was bright and alert without a touch of goître or of crétinism. I inspected the beggars standing in rows at the railway station, weak, inconsequential, useless, most of them, but not a *crétin* among them. Crétinism, like other forms of feeble-mindedness, is descended from crétinism. It finds its plain remedy in segregation in "the guarantee that each individual *crétin* shall be the last of his generation." In the elimination of the *crétin*, there are elements of Euthenics as well as of Eugenics. Cleanliness, good air, good food, as also the use of iodine, all tend to prevent the growth of the goître, and the goître is in itself a potent cause of idiocy.

Isolation

In isolation as under charity, weakness may mate with weakness and perpetuate degeneration. The classical studies of Dr. Dugdale into the natural history of the group of degenerates called "the Jukes," the descendants of "Margaret, the mother of criminals," shows that the conditions of the slums may be transferred to the forests. Outside of the swift current of life in a sheltered nook of the mountains, in Orange County, New York, this family of cut-throats and prostitutes found a place for development. The crush of a great city is in some degree an instrument of purification. It brings evil and weakness into close competition with wisdom and strength, and the former come to speedy destruction. The evils of the city rise from corrosion rather than from competition. There is nothing in the pure air of the mountains that will purify the lineage of thieves and paupers. Doubtless the fact of isolation and freedom from stress of competition has been a factor in the preservation of the decay-

The Jukes

ing Jukes, and the same conditions bring about the results in the declining classes driven from the plains to the mountains in other parts of the world. The Great Smoky Mountains are not responsible for the poor whites of the highlands of North Carolina. These people belong to the lineage of England's pauperism transported first to her colonies, afterward driven from the plains to the mountains because of their inability to keep slaves, and since preserved there by their isolation from new currents of life. In like manner, the lowest type of negroes is preserved in the isolation of the black belt of the South, the swampy regions near the sea, in which white people cannot live, and where the negroes are not subjected to the stress of industrial competition. Dr. Charles Wardell Stiles has lately shown that both whites and blacks of these lower types have been for generations infested with the parasitic worm Uncinaria, a cause as well as a result of their hopeless condition.

The Poor Whites

This world is not, on the whole, a hard

world to live in if one has the knack of making the proper concessions. Hosts of animals, plants, and men have acquired this knack, and they and their descendants are able to hold their own in the pressure of the struggle for existence. This pressure brings about the persistence of the obedient, those whose activities accord with the demands of their environment. This persistence of the adaptive is known as the survival of the fittest, which has through the ages been the chief element of organic progress. Among men there have always been those to whom the art of living was impossible. This has been the case under ordinary conditions as well as under extraordinary ones. It must be the case with some under any conceivable environment or any circumstances of life. Some variations must tend in the direction of incapacity. This incapacity of one generation, if inborn and not induced by disease or malnutrition, may be handed down by the law of heredity to the next.

In one way or another, in time, most of the incapables are eliminated by the proc-

ess of natural selection. But not all of them. Our social system is bound too closely. Hereditary incapacity of the few has been in all ages a burden on the men who could take care of themselves. With higher civilization and an increasing recognition of the value of mutual help it is becoming more and more possible for those to live who do not help. The descendants of these increase in number with the others. They are protected by the others. Thus the future of hereditary weakness is a growing problem in our social organization.

Mutual Help

Of course, the conditions of life have never yet made the "survival of the fittest" the real survival of the best. The growth of civilization approaches this end, but has never reached it. If this were reached, adaptation to the conditions of life would be a nobler process than it now is. It is not that the conditions of life are too hard. We would not make them easier if we could. But the welfare of humanity demands that

The Easy World

they be made more just. An easier world would be one in which idleness, vice, and inefficiency fare better than now, and energy, virtue, and efficiency correspondingly worse. The premium natural selection places on self-activity and mutual help is none too great at the best and should not be lessened. Nature is over-indulgent toward idleness rather than too cruel. The degradation of life in the tropics comes because in those regions the stress of the human struggles is distinctly lowered. Action and virtue count for little because there is no incentive to live a life worth living, and no adequate penalty for stagnation and inefficiency.

It is easy to frame indictments against modern society and its organization. We may see it as weak, tyrannical, depressing, artificial, brutal, sensual, frivolous, or unjust, as we may give attention to its least favorable manifestations. Nevertheless, the social organism of every nation is as good as man has been able to make it. In the evolution of man it has been a long struggle to attain even what we have. Better conditions will be pos-

sible with better material in humanity. Better relations demand better men. The more perfect the organism, the more evident are its deviations from perfect adaptation. The character of a nation is the expression of the character of its individual units.

It may be that in the conditions of life failure is not due to any defect of the individual. Its cause has often arisen in injustice and oppression which sometimes makes the just, the brave, the wise man an outcast from society. Such conditions and such failures occur in the life of to-day. But under ordinary conditions those who fail in life do so because of the lack of ability to make themselves useful to others, or for lack of ability to place themselves in harmony with the forces of Nature with which they are surrounded. In other words, most of those who fail are doomed to perish wherever there exists any form of competition, and no life is without it. The inert, untrained, ignorant, or vicious are constitutionally unsuccessful, and from conditions which these names imply. Those who thus fail to do their part in

the struggle of life must become a burden to be carried by others or else they perish, the victims of misery they can make no efforts to avoid. Those who are carried by society as burdens may be roughly classified as paupers and criminals—those whom society voluntarily support and those supported through society's lack of means of self-protection. Pauperism and habitual criminality are respectively passive and active states of the same disease.

Poverty and Pauperism

In this sense pauperism is not by any means the same as poverty. Poverty is the absence of stored-up economic force. It may arise from sickness, accident, or from various temporary conditions. The person now subject to poverty may have within himself the cure for it. The pauper can not cure himself, and all help given him but intensifies his pauperism. It is said that among the poor there are always three classes, "the Lord's poor, the Devil's poor, and paupers." The first class are those suffering through misfortune, the second the victims of vice,

the third, those incompetent through inheritance.

There are various conditions—sickness, dissipation, the weakness of age, evil associations—that may plunge the average man from poverty into pauperism. We are none too well equipped for the struggle of life at the best, and the loss of weapons or armor may make any man helpless for the time being. But some are helpless from birth. There is in every nation a multitude of men and women to whom fitness is impossible. In the submerged tenth of every land may be found the broken and stricken, the ruined in body and spirit. But the majority of these have never been, could never be anything else than what they are. They are simply incapable, and they are the descendants of others who in similar conditions have been likewise incapable. In a world of work where clear vision and a clear conscience are necessary to life they find themselves without sense of justice, without capacity of mind, without desire for action. They are born to misery, and the aggregate of misery would be sensibly lessened had they never been born.

The Human Sacculina Inactivity

It is a fact of biology that whenever any series of organisms are withdrawn from active life and the process of natural selection no longer offers a premium for self-activity, degradation sets in. Organs are lost as their functions are abandoned. In this way the descent of the inert barnacle from the active crablike forms is accounted for. In similar manner the degraded parasitic Sacculina is shown to be of crustacean or crablike origin. The young Sacculina and the young crab are essentially alike for a period after their birth. The crab continues and develops an active life. The Sacculina thrusts its feelers into the body of the crab on which it is to feed. Its organs of eating and swimming disappear. All structures connected with independent life become atrophied, and finally nothing is left of the Sacculina except its saclike body, its feelers or roots ramifying through the blood vessels of the crab, and its reproductive organs by which the brood of parasites is kept alive. When the habit of parasitism is once estab-

lished, the struggle for existence simply intensifies it from generation to generation.

The fittest Sacculina is the most degenerate one. In like manner whenever a race or family of men has fallen away from self-helpfulness the forces of evolution intensify its parasitism. The successful pauper is the one who retains no capacity for anything else. The loss of all other possibilities is the best preparation for the life of the sneak thief.

Recent studies, as those of Dugdale, McCulloch, Davenport, and many others, have shown that parasitism is hereditary in the human species as in the Sacculina. McCulloch has selected the Sacculina for special illustration of the results of like processes in the human family. Like produces like in the world of life. Those qualities in the grandparent which made him an outcast from society or a burden upon it reappear in the father and again in the son. As in one case, so in the others, they determine his relation to society. The pauper is the victim of heredity, but neither nature nor society recognizes that as an excuse for his existence. The

forces of nature take no account of motive and are no respecters of persons. Dugdale has shown that parasitism, pauperism, prostitutism, and crime reappear generation after generation in the descendants, of "Margaret, the mother of criminals." McCulloch, speaking of the descendants of a pauper family named "Ishmael," in the city of Indianapolis, uses the following language:

McCulloch on "The Tribe of Ishmael."

"We start at some unknown date with thirty families. These came mostly from Kentucky, Tennessee, and North Carolina. Of the first generation—of sixty-two individuals—we know certainly of only three. In the second generation we have the history of eighty-four. In the third generation of two hundred and eighty-three. In the fourth generation—1840-1860—we have the history of six hundred and forty-four. In the fifth generation—1860-1880—we have the history of six hundred and seventy-nine. In the sixth generation—1880-1890 — we have the history of fifty-seven. Here is a total of seventeen hundred and fifty individu-

als. Before the fourth generation—from 1840 to 1860—we have but scant records. Our most complete data begin with the fourth generation, and the following are valuable. We know of one hundred and twenty-one prostitutes. The criminal record is very large—petty thieving, larcenies chiefly. There have been a number of murders. The first murder committed in the city was in this family. A long and celebrated murder case, known as the 'Clem' murder, costing the State immense amounts of money, is located here. Nearly every crime of any note belongs here. Between 1868 and 1888 not less than five thousand dollars has been paid for 'passing' these people from place to place, each township officer trying to throw off the responsibility. The records of the city hospital show that—taking out surgical cases, acute general cases, and cases outside the city—seventy-five per cent. of the cases treated are from this class. The number of illegitimacies is very great. The Board of Health reports that the number of stillborn children found in sinks, etc., would not be less than

six per week. Deaths are frequent, and chiefly among children. The suffering of the children must be great. The people have no occupation. They gather swill or ashes; the women beg, and send the children around to beg; they make their eyes sore with vitriol. In my own experience I have seen three generations of beggars among them. I have not time here to go into details, some loathsome, all pitiable. One evening I was called to marry a couple. I found them in one small room with two beds. In all eleven people lived in it. The bride was dressing, the groom washing. Another member of the family filled a coal-oil lamp while burning. The groom offered to haul ashes for the fee. I made a present to the bride. Soon after I asked one of the family how they were getting on. 'Oh, Elisha don't live with her any more.' 'Why?' 'Her husband came back, and she went to him. That made Elisha mad, and he left her.'

"All these are grim facts, but they are facts and can be verified. More, they are but thirty families out of a possible two hun-

dred and fifty. The individuals already traced are over five thousand, interwoven by descent and marriage. They underrun society like devil grass. Pick up one, and the whole five thousand will be drawn up. Over seven thousand pages of history are now on file in the Charity Organization Society.

"A few deductions from these data are offered for your consideration. First, this is a study into social degeneration, or degradation, which is similar to that sketched by Mr. Lankester. As in the lower orders, so in society, we have parasitism, or social degradation. There is reason to believe that some of this comes from old convict stock which England threw into this country in the seventeenth century. We find the wandering tendency so marked in the case of 'Cracker' and the 'Pike' here. 'Movin' on.' There is scarcely a day that the wagons are not to be seen in our streets; cur dogs; tow-headed children. They camp outside the city, and then beg. Two families as I write have come by, moving from north to south, and from east to west, 'hunting work,' and yet we can give

work to a thousand men on our gas trenches.

"Next, note the general unchastity that characterizes this class. The prostitution and illegitimacy are large; the tendency shows itself in incests and relations lower than the animals go. This is due to the depravation of nature, to crowded conditions, to absence of decencies and cleanliness. It is an animal reversion which can be paralleled in lower animals. The physical depravity is followed by physical weakness. Out of this come the frequent deaths, the stillborn children, and the general incapacity to endure hard work or bad climate. They cannot work hard, and break down early. They then appear in the county asylum, the city hospital, and the township trustee's office.

"Third, note the force of heredity. Each child tends to the same life, reverts when taken out.

"And, lastly, note the influence of the great factor, public relief. Since 1840 relief has been given to them. At that time we find that 'old E. Huggins' applied to have his wife Barthemia sent to the poorhouse. A

premium was then paid for idleness and wandering. The amount paid by the township for public relief varies, rising as high as $90,000 in 1876, sinking in 1878 to $7,000, and ranging with the different trustees from $7,000 to $22,000 per year. Of this amount fully three-fourths has gone to this class. Public relief, then, is chargeable in a large degree with the perpetuation of this stock. The township trustee is practically unlimited in his powers. He can give as much as he sees fit. As the office is a political one, about the time of nomination and election the amounts increase largely. The political bosses favor this and use it—now in the interests of the Republican, now of the Democratic party. It thus becomes a corruption fund of the worst kind. What the township trustee fails to do, private benevolence supplements. The so-called charitable people who give to begging children and women with baskets have a vast sin to answer for. It is from them that this pauper element gets its consent to exist."

In every American city, as in Indianapolis, there exists a large number of people

who, in the ordinary course of life, can never be made good citizens. Our free institutions do not make them free; our free schools do not train them; our churches do not contain the means of their salvation. It is well to face the fact that the existence of the great body of paupers and criminals is possible only by feeding them in one way or another on the life-blood of the community. It is the presence of this class which adds terror to poverty. It is they which make intolerable the lot of the worthy poor. The problem of poverty and misfortune is a difficult one at best. It is rendered many times more difficult by the presence among the poor of those whom no condition could bring to the level of self-helpful and self-respecting humanity. The difficult problem of the unemployed becomes far more difficult when associated with the hopeless problem of the unemployable. It has been said that "were the great wave of charity to cease for a month, pauperism would disappear." The paupers, not the poor, would perish were they forced for a month to be self-dependent.

Paupers as Parasites

It is not important to our present discussion to consider how these conditions arose. It may be a defect of human society that the law of natural selection has not had its perfect work. The destruction of the unfit has not kept pace with their power of reproduction. We may blame the kind influence of charity for lack of discrimination in its efforts for the help of our neighbors. The indiscriminate charity of the middle ages is responsible for much of the misery of ours. It is only in very modern times that charity has had any relation with justice. It is only lately that science has shown that charity is to be judged not by its motives but by its results. "Charity, falsely so-called," says McCulloch, "covers a multitude of sins, and sends the pauper out with the benediction, 'Be fruitful and multiply.' Such charity has made this element, has brought children to birth, and insured them a life of misery, cold, hunger, sickness. So-called charity joins public relief in producing stillborn children, raising prostitutes, and educating criminals."

Whatever the causes of hereditary ineffi-

ciency, it exists in our civilization. It is part of our social fabric. It is an element not less difficult than the race problem itself. The race problem is indeed a phase of it, for when a race can take care of itself it ceases to have a problem.

Hereditary inefficiency is therefore a factor in society. It must be considered as a factor in civil affairs. In what way does it affect the problem of government? In municipal government its evil effects are at once apparent. A single group of related families, all helpless and hopeless by heredity, formed in the clean and wealthy city of Indianapolis some four per cent. of the population—5,000 in perhaps 125,000. In other American cities, notably in San Francisco, with its mild climate and proverbial hospitality, the percentage is greater, for more of these families are represented. In no city are they absent. Self-government by such people is a farce. No community was ever built up of thieves and imbeciles. The vote of the dependent classes is always purchase-

Pauperism a Factor in Government

able. The co-ordination and sale of this vote and of the allied criminal vote are the work of the most dangerous of the dirty brood of political bosses. It is the stock in trade of every king of the slums. This vote can be bought with the money of candidates. It can be bought with spoils of office. It can be bought with public funds set aside for purposes called charity.

The various forms of outdoor relief constitute, as McCulloch has shown, "a corruption fund of the worst kind."

Corruption Fund of Public Charity

Of all our enterprises, the people of the United States have been least successful in the management of their cities. This failure is most complete where the manipulators of paupers and criminals are boldest and most effective; moreover, the effluvium of municipal corruption flows out and poisons the politics of the state and the nation. Our ancestors suffered in their degree from the evils of force. Our descendants will find themselves beset by the evils of weakness.

Every venal, cowardly, or ignorant

voter is a menace to the safety of republican institutions. The essential purpose of popular suffrage is not to secure good government, but to produce an interest in civil affairs that will sooner or later bring about good government. This growth in civic knowledge is impossible without a foundation of intelligence. The choice of negro suffrage was the wisest choice among the many wrongs having their rise in negro slavery. It was the least of the evils, no doubt, but an evil nevertheless. Every evil is likely sooner or later to become a festering sore in the body politic.

Foreign Immigration

The dangers of foreign immigration lie in the overflow to our shores of hereditary unfitness. The causes that lead to degeneration have long been at work among the poor of Europe. The slums of every city in the Old World are full of the results. The slums of London, filled for the most part by the descendants of those whom war could not use, develop a type of men who cannot make a living anywhere under any conditions. Ap-

parently few cases of hereditary inefficiency exist in America that could not be traced back through pauper lineage to dependent classes in the Old World. It takes many generations to found a pauper stock. Misfortune, sickness, intemperance, the weakness of old age, often lead to poverty and personal misery. Personal causes do not lead to hereditary pauperism. The essential danger of unrestricted immigration is not in bringing in an alien population strange to our language and customs. Language and customs count for little if the blood is good. The children learn our language, even to the forgetting of their own. Love of our country is just as genuine in Norwegian or German dialects as it is in English or Irish. There is little danger, either, in violent opinions or iconoclastic theories. The red flag of anarchy will not long wave where real oppression does not exist. At Castle Garden in New York, we should turn back, not those individuals, ill, aged, or infirm, or likely to become a personal charge on public charity, but should rather reject those whose descendants are

likely through incompetence and vice to be a permanent burden on our social or political order. Better admit a hundred aged paralytics than one white slaver, or one "Margaret, mother of criminals."

But the immigration of poverty, degradation, and disease makes government by the people more and more difficult. Every family of "Jukes" and "Ishmaels" which enters at Castle Garden carries with it the germs of pauperism and crime. They bear the leprosy and crime of the Old World to taint the fields of the New. The "assisted immigration" to New South Wales is to-day a curse to Australia. The assisted immigration at Jamestown years ago has left its trail of pauperism and crime from Virginia across Carolina, Kentucky, Indiana, Missouri, even to California and Oregon. Wherever its blight has gone there are the same inefficient men, sickly women, frowsy children, starved horses, barking cur dogs, carelessness, vindictiveness, and neglect of decency.

Assisted Immigration

Withdrawal from the competition of

life, withdrawal from self-helpful activity, aided by the voluntary or involuntary assistance from others—these factors have made that which McCulloch calls "the tribe of Ishmael." These conditions bring about the same results in all ages and among all races, among the lower animals as well as among men. The same effects of similar causes are seen in the decline of royalty and nobility of Europe as well as the degradation of European *crétins* and thieves. There is no progress without competitive activity, and no race is so perfect that judicious weeding out could not improve it.

National Life of England

In a thoughtful book on the national life of England, Mr. Karl Pearson finds the outlook discouraging. He says: "The stability of the nation depends essentially on the fitter stock being given sensibly greater fertility than the unfit stock. . . . . Whether knowledge of what is going on can possibly bring about a change of feeling I cannot say. If it does not, and we leave the fertile but unfit one-sixth to reproduce one-

half the next generation, our nation will soon cease to be a world power.

"The problem is simple in the extreme; we have two groups in the community, one parasitic to the other. The latter thinks of to-morrow and is childless; the former takes no thought and multiplies. It can only end as the case so often ends—the parasite will kill its host, and so end the tale for both alike."

But in England this process is facilitated by parasitism at the top as well as at the bottom. The whole array of the non-producing rich, the crushing effect of war-debt and war-taxation, the weakness bred by the reversal of selection in war, the evil land-laws which check the growth of self-respecting yeomanry, and the feeling that it is somehow a disgrace to work if there is any way of avoiding it, all these are elements which make it still easier for the nation to slip down the inclined plane of history.

Mr. James H. Collins cleverly says: "It is just within the possibilities that somebody may introduce into Parliament an Act to Establish the Respectability of Work.

. . . Anything that will give work a better status is sure to do the country a lot of good. The Britisher is not an idler by any means. He toils hard enough, but his highest ambition is still to work just hard enough to get just money enough to stop work altogether and be a gentleman. . . . There is an unmistakable belief in the sentiment of the old toast that 'Work is the Curse of the Drinking Classes.' . . . This makes money the end of business instead of a by-product, and fills the British world of affairs with Dombeys large and small."

The uncontributing Old Age Pension begins at the wrong end of this problem. It strikes a blow at the impulse of individual self-activity, as the enforced contributing system of Germany strikes a blow at personal freedom.

What can be done to remedy this source of evil? To know the evil is to go half way toward its cure. Penal reform, charities reform, civil-service reform, the prohibition of pauper immigration, education in social science —all these look in the direction of cure. In

knowledge lies the surest remedy for most social and political evils. Let us see our enemy face to face and we can strike him. What more can be done is the work of students of social science to determine. Dr. Amos G. Warner has well said that the "true function of charity is to restore to usefulness those who are temporarily unfit, and to allow those unfit from heredity to become extinct with as little pain as possible." Sooner or later the last duty will not be less important and pressing than the first. Good blood as well as free schools and free environment is essential to the making of a nation.

"Freedom which is Thraldom"

I have elsewhere used these words: How long will the Republic endure? So long as the ideas of its founders remain dominant. How long will these ideas remain dominant? Just so long as the blood of its founders remains dominant in the blood of its people. Not the blood of Puritans and Virginians alone, the original creators of free states, but the blood of free-

Future of the Republic

born men, be they Greek, Roman, Frank, Saxon, Norman, Dane, Celt, Scot, Goth or Samurai. It is a free stock that creates a free nation. Our Republic shall endure so long as the human harvest is good, so long as the movement of history, the progress of science and industry, leaves for the future the best and not the worst of each generation.

Slavery

The condition of slavery is one favorable for human degeneration. The survival of the docile is its essential feature in slavery. There is no premium placed on individuality, no advantage in intelligence, and a positive disadvantage in the impulses of self-direction. A slave cannot be a man, and the qualities of manhood are checked and destroyed in slavery.

The Slums

In the slums of the cities similar conditions obtain. In the life of hopelessness there can be no premium on hope. The "artful dodger" is a typical product of the natural selection of the slums. Kipling's Badalia Herodsfoot stands as a type of its otherwise

worthy victims. To be well born but brought up in the slums means to be born to premature death. The child of the slums, fitted to his environment, must come of the lineage of moral decay.

The Tropics

In the tropics, conditions favoring human degeneration are constantly present. The intense heat discourages physical or mental activity, while the slight stress of physical surroundings favors the weak, the vacillating, the inert. No premium is placed on effort, and there is developed a type of man to whom effort is impossible. According to General Woodruff, the effect of overmuch sunlight tends to personal degeneration of the fairer races. The purpose of skin-pigment is to protect the nervous system from the sun's rays. A dark skin in the tropics is essential to the continued existence of the race. However this may be, many of the conditions under the tropics closely resemble those seen under ill-advised charity. Nature is too kind and too indiscriminating. As a result, we have as pauper races the descend-

ants of the once civilized and once active Arabs, Egyptians and Saracens. With the decline of effort goes the failure of personal will, and the growth of the philosophy of fatalism, in which the human will is held to be of no worth. It is the will of Allah that the Arab should sleep in filth, and die of rottenness. It is related by Professor Edwin H. Woodruff that not long ago a cesspool in a palace at Cairo was to be cleansed. The vault was opened, and two or three of the workmen were suffocated by the foul gases. "It is Allah's will," said the person in authority, "it is Allah's will that the vault shall not be disturbed." So it was closed again, that its foulness might increase for another century. In the tropics man knows little of competition. He cares not for time. The best man is the laziest, and no civilized race of men has yet held its own under these conditions. The strong races were born of hard times, they have fought for all they have had, and the strength of those they have conquered has entered into their wills. They have been selected by competition and sifted

by the elements. They have risen through struggle and they have gained through mutual help, and by the power of the human will they have made the earth their own.

Luxury

In luxury, again, are found conditions of degeneration. When one has all that he wants, there is little incentive to strive for anything more. When a race is raised above competition, there is no premium on the qualities that make for life. The sheltered life does not favor progress. Where the possibility of the misery of want is excluded there is still room for the misery of *ennui,* the pressure of existence unresisted by effort. Much of that degeneration of the higher classes of Europe, which Nordau has attributed to the "inheritance of fatigue and nerve-strain of civilization," is simply personal and not inherited. It is the natural result of the loss of personal incentive to action. It is the laziness and weakness engendered in the paupered and sheltered life. In the society in which this form of degeneracy appears we find a maximum of sense impressions and a

minimum of action. Where thought does not go over into action a sort of mental dyspepsia is produced. To this abnormal condition the term "degeneration" has been applied, but this name is misleading, because it implies more than the actual truth.

The Higher Foolishness

To a phase of degeneration Mr. Israel Zangwill has lately applied the clever designation of "the higher foolishness." By this is meant unbalanced action and expression on the part of people of culture or education. It is act or speech "which makes the judicious grieve" on the part of those supposed to know better. Such people lacking the saving grace of common sense are most of those called by Nordau "degenerates." With these belong the "monkey geniuses" of Dr. Hirsch, the "borderland dwellers" of Dr. Maudsley, the "borderlanders" of Mr. Stead, the "*dégenerés superieurs*" of Magnan, the "mattoids" of Lombroso, and, in general, the inspired idiots and educated fools of all ages and climes.

These people have in common the qual-

ity of abnormal mental action, verging into insanity on the one hand, to crime on another, and to stupidity on the third. They are, however, distinguished from ordinary idiots, or lunatics, or criminals by some notable quality, by some power of action or expression or attribute of genius which causes them to attract public notice.

The Mattoid

Sanity is the antidote for insanity, cleanliness of thought and action in life for folly and crime. It is true, as has been said, that "vice, crime, and madness are called by different names only through social prejudice." In like manner virtue, purity, and wisdom are largely convertible terms. The sane man is like a well-made watch—trained to keep correct time under all conditions of temptation, pressure, or environment. The "mattoid" is full of "vibrancy"; he is affected by all sorts of conditions, external and internal. He is like the watch which changes its rate of movement at all sorts of intervals, that will run off the whole twenty-four hours in a minute, and then will not

move at all for a day to come. He must have a hard head who would butt against the stone wall of society and make an impression upon it. The sound nervous system is one well buried in skull and flesh. It knows not the "pride of vibrancy," the "bliss of the beautiful," nor the mystic "sensations of the elect mind." It has no love for the "flowers of evil," the "litany of Satan," nor any aspect of what Starr King called the "rotten side of things." It is satisfied with the life and duties of today, and can find pleasure in these rather than in frantic attempts to seize the unknown day after to-morrow. The sober man will not believe that "that which is profound loves the mask," nor that what actually "occurs is spoiled for art." To him, as to Marcus Aurelius, "the gods are still at the head of the administration, and they will have nothing but the best." So in that part of the universe where he finds himself he finds also his duty.

"The normal man," Nordau wisely says, "with his clear mind, logical thought, sound judgment, and strong will, sees where

the degenerate only gropes. He plans and acts where the latter dozes and dreams. He drives him without effort from all the places where the life-springs of Nature bubble up; and, in possession of all the good things of the earth, he leaves to the impotent degenerate the shelter of the hospital, lunatic asylum, and prison in contemptuous pity. Let us imagine the driveling Zoroaster of Nietsche with his cardboard lions, eagles, and serpents, or the noctambulist Des Esseintes of the Decadents, sniffing and licking his lips, or Ibsen's 'solitary powerful' Stockmann, and his Rosmer lusting for suicide—in competition with men who rise early, are not weary before sunset, who have clear heads, solid stomachs, and hard muscles."

The Normal Man

But in this connection we may remember that competition is not destruction. The degenerates have been helped on by their rivals more than they have been harmed. They have been borne on the shoulders of civilization, and it is the altruism of science which has made their non-science compara-

tively safe. It is the toleration of the sane that gives the insane the right to live. It is the power of the strong that maintains the weak. In the long run the struggle for existence will destroy the lineage of the decadents of today. No shelter can long avail against the "goodness and severity of God." But the folly which now exists is intrenched behind wisdom. The kindness of man postpones the judgments of nature.

Genius

It is not true that "genius is a disease of the nerves," as certain writers have insisted, if by genius is meant forcefulness of any sort. Real effectiveness arises from continuous effort in high directions. We are sometimes astounded by a single product of a man incapable of continuous thought, but the world is not moved by such men, nor has the literature of the ages been produced by them. Great men live great lives. The great work is the great life's impression. There is nothing occult, nothing mystic, nothing hysterical in greatness of mind or heart. Disease of the nerves is not genius; still less

is it an attribute of greatness. To do great things in life, to think nobly, to write clearly, to have a sincere feeling for beauty and grace, it is not necessary to have broken any of the Ten Commandments.

Most of the phenomena of decay described by Nordau stand related to mental disease at once as cause, effect, and symptom. Drunkenness, for example, is the cause of more drunkenness, of further decay of will. It is the symptom of the decay of will. It is the effect of it. In like manner the love of mysticism grows with its license; the love of filth with what it feeds upon. Egomania increases with self-admiration, sexual madness with its own indulgences. The fantasies of those who "have only to hear of Buddhism to become converts to it" furnish their own arguments and their own justification. Hysteria, catalepsy, and echolalia have many times taken unto themselves the name of religion, and proved the truth of this religion by their own excesses.

Much of the "decadent literature" of the day is not the product of the decadence

of man. It is not the effect of "nerve strain of overwrought generations born too late in the dusk of the ages." It is simply an unwholesome fashion. Most of it is the work of sane men of mediocre abilities who throw themselves into grotesque postures in the hope that they may thereby arrest the fickle attention of the public. It is the effort of mountebanks to catch the people's eye. When the public becomes accustomed to froth and symbolism, it is equally surprised and delighted with sweetness and sanity. Neurotic freaks and egomaniacs have been found in all ages. The memory of those of earlier ages has passed away, as those of to-day will soon be forgotten. The end of the nineteenth century has no new form of "the higher foolishness" which the preceding centuries did not know. It can only offer better facilities for publicity than could be had in earlier times. There is money now in the production of literature of decay. In so far as folly and nervous disorder are innate and hereditary, not individual, we have no reason to suppose that they are in any

Decadent Literature

sense a product of the rush of modern civilization.

Most of the degeneration so cleverly treated by Nordau is purely the result of defects in the life of the individual, in his relation to his environment, and the course of action by which his character is formed. Without going into a detail for which I have neither space nor ability, I may say that the development of mysticism, symbolism, "hearts insurgent," and general mental and moral vagabondage is caused by the lack of sober living and of wholesome work, the lack of motor ideals and of outlet for effort.

Opportunity Without Training

In the cities of Europe the common man has risen to a life of larger possibilities and greater opportunities for success and failure without adequate training for such activity. Society has been compared to a band of schoolboys in charge of a railway train. They know not what to do nor how to do it, and are more interested in present enjoyment than in the success of any enterprise intrusted to them. Small-minded men lost in a multi-

plicity of impressions are likely to do things which suggest degeneration. If to this we add the wide diffusion of corrosive elements, narcotics, stimulants, impure suggestion, unwholesome living, we have elements which tend toward personal degeneration. As their influences affect many persons alike, they appear as a form of social decadence.

The Drooping Spirit

We find, moreover, in parts of Europe, the prevalence of "a strange drooping of spirit." This feeling that civilization is confined in a blind channel, a *cul de sac,* is a natural result of the great increase of the results of sense-perception without corresponding outlet in action. "Progress," says Edward A. Ross, referring to this condition, "seems to have ended in aimless discontent. The schools have produced, according to Bismarck, ten times as many over-educated young men as there are places to fill. The thirst for culture has produced a great hungry intellectual proletariat. The forces of darkness are still strong, and it seems sometimes as if the middle ages would swal-

low up everything won by modern struggles. It is true that many alarms have proved false, but it is the steady strain that tells on the mood. It is pathetic to see on the Continent how men fear to face the future. No one has the heart to probe the next decade. The outlook is bounded by the next Sunday in the park or the theatre. The people throw themselves into the pleasures of the moment with the desperation of doomed men who hear the ring of the hammer on the scaffold. Ibsen, applying an old sailor's superstition to the European ship of state, tells how one night he stood on the deck and looked down on the throng of passengers, each the victim of some form of brooding melancholy or dark presentiment. As he looked he seemed to hear a voice crying, 'There's a corpse on board!' "

Nordau's Degeneration

The record of degeneration in music, in art, in literature, in religion, as traced by Nordau, is the record of loss of hope and loss of illusion. In so far as it is honest, not a mere affectation, it is the cry called

out by the misery of personal or social decay. It is the expression of mental dyspepsia and physical impotence. It finds a large part of its explanation in the fact that, with the class affected by it, sense-impressions, feelings, and impulses have far outrun the opportunities for action. The cure for this condition is found in ambition, effort, individual development. It is not the swift rush and whirl of modern civilization which has brought all this to pass. It has come rather from attaining the results of this rush without taking part in its effort. A similar thought is expressed by Kant, as quoted by Mark Pattison. Of "Schwärmerei," or philosophical revery, he says: "This mental disease arises from the growth of a class which has not yet thorough science, yet is not wholly ignorant. It has caught up notions on current literature which makes it think itself on the same level of those who have laboriously studied the sciences. I see no other means of checking the mischief, except that the schools should reform their method and restore *thorough* teaching instead of that teaching of many

things which has usurped its place." Thoreau speaks of the derivation of "vile" and "villain" from *via,* way, and *villa,* village. "This suggests," he says, "that kind of degeneracy villagers are liable to. *They are wayworn by the travel that goes by and over them* without traveling themselves."

Sensation and Action

The evil effect of the excess of sense impressions and of thought dissociated from will and action has been noted many times and in many ways. When men have made themselves wise with the lore of others, the learning which ends in self and does not spend itself on action, they have been neither virtuous nor happy. "Much learning is a weariness of the flesh." Thought without action ends in intense fatigue of the soul, the disgust with all "the sorry scheme of things entire," which is the mark of the unwholesome and insane philosophy of pessimism. This philosophy finds its condemnation in the fact that it has never yet been translated into pure and helpful life.

In like manner sentiment not woven in-

to action fails to be a source of effectiveness or of happiness. "If thou lovest me," said Christ to Simon Peter, "feed my lambs." Genuine love works itself out in self-spending, in doing something for the help or pleasure of those beloved. Religious sentimentalism, whatever the form it may take, if dissociated from action, has only evil effects. Appeal to the emotions for emotion's sake has been a great factor in human deterioration. Much that has been called "degeneration" in modern social life is due to the predominance of sensory impressions over motor movement. The mind passes through a round of sensations, emotions called up by literature, music, art, religion, which may not have any direct bearing on human conduct. Their aggregate influence on the idle brain is always evil. And the misery of motor paralysis, of intellectual pauperism, is felt as the disease of *ennui*. The remedy for evils of revery, *ennui*, narcotism, and the like, is to be found in action. The knowledge of this fact constitutes the strength of the Salvation Army movement. The victim of mental de-

terioration, the "opium fiend" or the inebriate is given something to do. He is not to wear out the little force he has left in ineffective remorse. Better let him beat a big drum and make night hideous with unmusical song than to settle down to the dry rot of revery or the wet rot of emotional regret. Something to do and the will to act furnishes the remedy for all forms of social or personal discontent.

The Power of Attention

Not every sense impression can demand distinct response. It is the function of the intellect to sift these impressions, turning over into action only those in which action is desirable or wise. The power of attention is one of the most valuable attributes of the trained mind. And the essential of this power is in the suppression by the will of all impulses which do not concern the present need of action.

As the normal workings of the mind are reducible to sensation, thought, will, and action, so the abnormal workings may be due to defects of any one of these elements. We

may have defects of sensation, defects of thought, vacillation of will, and inaccuracy of action. Hyperæsthesia, anæsthesia, sensory weakness, appear in the uncertain action of the muscles guided by the ill-formed or over-informed brain. The defects and diseases of the brain itself appear in many ways, ranging from oddity or folly to the extreme of idiocy or mania. Many of the "psychic phenomena" along "the borderland of spirit," which occupy a large part in current literature, are features of insanity. The phenomena of hysteria, faith cure, openness to suggestion, subjective imagery, mysticism, are not indications of spiritual strength, but of decay and disintegration of the nerves. The ecstasy of unbalanced religious excitement and the stupor of a drunken debauch may belong to the same category of mental phenomena. Both point toward moral and spiritual weakness. There are no occult or "latent powers" of the mind except those which have become useless in changed condi-

Defects of Mind

Hysteria

tions, or which belong to the process of disintegration. If a man crosses his eyes and is thus enabled to see objects double, we do not regard him as having developed a "latent power" of vision. He has simply destroyed the normal co-ordination of such power. One does not increase the strength of a rope by untwisting its strands. The effectiveness of life depends upon the co-ordination and co-operation of the parts of the nervous system. Its strands must be kept together. To move in a state of revery, "to live in two worlds at once," to be unable to separate memory pictures from realities, all these are forms of nervous disintegration. Every phase of them can be found in the madhouse. The end of such conditions is death. The healthy mind should combat all tendencies toward disintegration. It can be clean and strong only by being true.

In like manner the influence of all drugs which affect the nervous system must be in the direction of disintegration. The healthy mind stands in clear and normal relations with Nature. It feels pain as pain. It feels

action as pleasure. The drug which conceals pain or gives a false pleasure when pleasure does not exist forces a lie upon the nervous system. The drug which disposes to revery rather than to work, which makes us feel well when we are not well, destroys the sanity of life. All stimulants, depressants, narcotics, and tonics which affect the nervous system in whatever way reduce the truthfulness of sensation, thought, and action. Toward insanity all such influences lead; and their effect, slight though it be, is of the same nature as mania. The man who would see clearly, think truthfully, and act effectively must avoid them all. Emergency aside, he cannot safely force upon his nervous system even the smallest falsehood. And here lies the one great unanswerable argument for total abstinence; not abstinence from alcohol alone, but from all nerve poisons and emotional excesses. The man who would be sane must avoid, emergencies excepted, all nerve excitants, nerve soothers, and "nerve foods," as well as trances, ecstasies, and similar abnormal relations to the external world. If he

would keep his mind he must never "lose his head" save in the rest of normal sleep.

Great work is not accomplished under the influence of drugs, least of all those nerve depressants which pass as "stimulants." The great thoughts and great deeds which move the world are those of men who live soberly, whose nervous systems record truthfully the facts of nature and of life, and whose nerve-responses are in perfect adjustment.

The Mind of Nations

What is true of man is true of other animals in their degree, and true of nations as well. For a nation is an aggregation of many men, as a man is a coalition of many cells. In the life of a nation, Lowell tells us, "three roots bear up Dominion—Knowledge, Will, the third Obedience, the great tap-root of all." This relation corresponds to the nervous sequence in the individual. And as in general the ills of humanity are due to untruthfulness in thought and action, so are the collective ills of nations due to national folly, vacillation, and disobedience. The laws of national greatness expand

themselves from the laws which govern the growth of the single cell.

From all institutions a certain form of degeneration must arise, because all institutions tend in some degree to do away with individual effort. A common creed for men weakens the force of individual belief. Common ceremonies destroy the spontaneity and personality of the feelings they represent. Right action by statute and convention is in some degree opposed to virtue by personal initiative. Between unregulated individualism or anarchy, and all-controlling institutions or slavery, there must always be a just mean. To find and maintain this just mean from generation to generation is the function of social reform. The reform of the day has been always in the direction of greater personal freedom. "As a snow bank grows where there is a lull in the wind," says Thoreau, "so where there is a lull in the truth, institutions spring up; by and by the truth blows over them and takes them away." All forms of tyranny have their beginning in

Institutions

kindness. Paternalism in time hardens into oppression and checks the growth of the individual man, who should become responsible to himself and for himself. The intelligence and freedom of one's neighbors, not the force of statute nor the power of arms, are the guarantee of social security.

Causes of pauperism may be found in other forms of giving as well as in those recognized as charity. Mental pauperism is produced when men are given truth instead of being trained to search for it. There are schools which tend to make intellectual paupers instead of training men to think for themselves. There is a moral pauperism induced by the giving of precepts. Right conduct must be individual if it is to have stability. The doing of an honest piece of work honestly may have more force in moral training than a hundred sermons. In like manner spiritual pauperism may be produced by religious instruction. Each man must make his own religion. He must form his own ideals. In the degree that he is re-

Mental Pauperism

ligious he must in time become his own high priest, as in the degree that he is effective he must be his own king.

I have elsewhere on many occasions spoken of the reversed selection of war. Like the seed is the harvest. War destroys the best human seed, leaving the weaker to germinate. Hence after every war "the human harvest is bad." Hence comes the final and bitter truth, the essence of the history of every war-like nation, as thus expressed by Benjamin Franklin: "Wars are not paid for in war time; the bill comes later!"

Artificial Selection

In connection with our knowledge of Eugenics, it is clear that with the extension of the science two results must follow. The first is a tendency towards wiser mating on the part of men and women of intelligence and education. The second is the limitation by public authority of the marriage of the defective, the insane, and the criminal. In the latter respect, there must be natural limitations. The public must give the individual the benefit of every doubt, for its own

machinery of police officers, Justices of the Peace, and guardians of the poor is not above reproach. The defective has, at least, the right to be judged by a jury of his peers, before he is condemned to celibacy or to the quasi-sterilization known as vasectomy. In these matters, the state cannot take a radical position until its own methods are assured to be the methods of impartial science.

A third result is sometimes the dream of enthusiasts, the formation of a superman by the processes of selective breeding, the finest of of all fine arts which deal objectively with life. The result could be reached, so far as physical and mental characteristics are concerned, in a few generations if the best of men and women could be induced to submit themselves to the methods of selection.

The name "selection" has long been used for the process by which breeds or races of domestic animals or plants have been formed in the past, the process by which today the skillful breeder can develop new forms at will. It is the "magician's wand" by which the breeder can summon up any

form of animal or plant that may meet his needs or delight his fancy.

In general the production of a new race of animals or plants in domestication is the outcome of a number of factors, in which the human will plays a leading part, a part which increases with the complexity of the result attained. In this process we have, in general, the following stages: —

1. Unconscious selection, with the separation of those chosen from the mass.

The Fine Art of Breeding

2. Conscious selection of the non-desirable individuals.

3. Conscious selection directed towards definite or special ends.

4. Crossing with other races or hybridizing with other species, in order to increase the range of variation or to add or to combine certain specific desirable qualities, while eliminating those undesirable, this accompanied by conscious selection directed towards definite ends.

On this last group of processes selection as a fine art must depend. The successful ex-

periments of Luther Burbank with the cactus, the walnut, the plum, the daisy and a multitude of other plants come under this fourth head. To the same class belongs the sheep-breeding of Australia, the development of race-horses, and all important work in the improvement of domestic animals and plants for whatever purpose.

Breeding of the Superman

At the best, the mating of man has rarely advanced beyond the second stage, the choice of the best available, and in more than half the cases, even in civilized countries, mere propinquity is the main determining factor.

It is evident that the human race is quite as plastic as the horse or sheep, and that if mating could be carried toward definite ends, even for a few generations, there might be startling results. It would be easy in a few generations under competent control to standardize strength, beauty, endurance or virtue. But there seems to be no possibility that any group of scientific men could ever be called on to exercise such control. More-

over, those best worth while would never submit to it. The best of men and of women will always choose their mates for themselves. The artificial breeding of the superman, if such a thing can be conceived as a practical matter for the state to undertake, would defeat its own ends. It would breed out of existence the two most important factors the race has won, so far as mating is concerned. These are love and initiative. The superman produced by official eugenics would not take his fate into his own hands, and his descendants would not know the meaning of love.

The practice of Eugenics, has then, its limitations, and the Richard Roe of the future will be a chip of the same block as the Richard Roe of the past.

Counting One's Ancestors

I made the statement above that Richard Roe had twice as many ancestors as his father or his mother. This is self-evident, and at the same time untrue, because father and mother alike have counted the same ancestors many times apiece. By a

thousand strains, for example, each of us leads back to Alfred the Great. Over and over again in any line of ancestry strains of blood have crossed, and the same person, and therefore the whole of this person's ancestors, will be found in different places in the individual pedigree. This must happen dozens of times in most lines of ancestry. The lack of old records obscures this fact. That something of the sort must occur is evident from the fact that the child of to-day must have had at the time of Alfred the Great an ancestry of 870,672,000,000 persons. In the time of William the Conqueror (thirty generations) this number reaches 8,598,094,592. This is shown by the ordinary process of computation—two parents, four grandparents, eight great-grandparents, and so on. As the aggregate of Englishmen in Alfred's time, or even in William's, was but a very small fraction of these numbers, most of these ancestors must have been repeated many times in the calculation. Each person who leaves descendants is a link in the great chain of life, or rather

a strand in life's great network. It is certain that the blood of each person in Alfred's time who left capable descendants is represented in every family of England of strict English descent. In other words, almost every Englishman is descended from Alfred the Great, as, very likely, also from the peasant woman whose cakes Alfred is reputed to have allowed to burn. Moreover, there are few, if any, who do not share the blood of William the Conqueror; and most ancestral lines, if they could be traced, would go back to him by a hundred different strains. In fact there are few families in the south and east of England which have not more Norman blood than the present royal family. The house of Guelph holds the throne not through nearness to William, but through primogeniture, a thing very different from heredity.

The late Mr. Edward J. Edwards, of Minneapolis, has furnished some very interesting studies in genealogy yet unpublished. These concern the lineage of his little daughter, my niece, Mary Stockton Edwards. Mr.

Edwards found that the little girl, like millions of others, is descended through at least two different lines from William the Conqueror. The lineage, on the one hand, leads back in thirty-two generations through the family names of Jordan, Hawley, Waldo, Lake, Elderkin, Drake, Grenville, Courtney, Gilbert, Prideux, Denys, de Bohun, and Plantagenet to William. Sir Humphrey de Bohun married Elizabeth Plantagenet, daughter of King Edward I. In the ancestry of King Edward are Saxon kings Cedric, Egbert, Alfred, and Ethelred, while intermarriage with other royal lines brings in Hengist, Hugh Capet, Charlemagne, Otto the Great, Duncan, Rurik, Igor, San Fernando, and a host of other notables of whom one would have less right to be proud. The Courtneys, Earls of Devon, are again descended from the royal lines of France (Hugh Capet) and Russia, but not from William the Conqueror. To Courtney and Plantagenet the lineage of the Edwards family along other lines has been traced.

Lineage of a Little Girl

The seventy family names, more or less,

with perhaps a thousand representatives, in the first line traced out by Mr. Edwards, are only so many individuals of billions, if there were no duplications. If there were no repetitions, there would be instead of the thousand known ancestors, four billions of persons between Mary Stockton Edwards and the time of William the Conqueror. This genealogy is therefore but a strand from an enormous network, which, if written out in full, would cover the earth with names. Only the family pride of the Courtneys and Drakes caused even this little of personal descent and personal history to be retained. Their pride permitted this plebeian record of the plebeian descendants of the Puritan John Drake of Windsor and of Rufus Jordan of Jordan in Devon to be joined to the sacred annals of the English peerage.

All Englishmen of Royal Lineage

Most of the English people named in these records lived in Devon or Somerset, from which regions the American representatives came to America. The subordinate lines traced out lead to the earls

of these countries. They lead also to many other noble lines in England and Scotland. It is certain, however, that in this there is nothing whatever that is exceptional or even unusual. These people in America were of the Pilgrim type, plain farmers, squires, and shipwrights, with a lineage or character in nowise singular. Their sole important heritage was the Puritan conscience; not their Norman blood, which they shared with all their neighbors. With these were other traits, good or bad, characteristic of their actual ancestry. "No Devon man, nor Somerset either, ever did more work than his maker made him." This feature is just as well marked in New England as the "Puritan conscience" itself.

Studies of this kind show clearly that *primogeniture* is mainly responsible for the difference between Roundhead and Cavalier, between Royalist and Puritan. Roundheads and Puritans were descended from daughters and younger brothers. On one of Cromwell's battle flags were these words: "We do not see why the elder son should have

everything and we have nothing." The "blue blood" flows only in the veins of the eldest son. But the eldest son of the eldest son forms but a very small fragment of the whole. Galton's remark to the effect that the character of England has suffered through the segregation of its strongest representatives as nobility and their exposure to the deteriorating influences of ease and unearned power is scarcely justified. A few individuals have suffered, but not England. They are only the conspicuous few. The rest have joined the mass of common men whose greatness makes England great.

Samuel Johnson remarks that primogeniture is a most excellent practice: "It ensures that there shall be but one fool in the family."

Primogeniture

One of the many daughters of some king marries a nobleman; a later scion of nobility is joined to some squire; some daughter of a squire is married to a farmer. The farmer's children thus have royal blood in their veins. Or, by reverse

process, plebeian blood may enter—and to its advantage—the bluest of nobility. The thirty generations since William's time each contain a far and wide mixture of blood. That the descendants of these crosses are alive to-day indicates that in the main each individual has a sound heredity. For a rotten link means the breaking of the chain. Even royal blood is not necessarily degenerate. That which was so has been strengthened by plebeian strains. There can be few if any Englishmen or Americans to-day but have royal blood in their veins. There is probably not a king living who has not somewhere in his ancestry the bar sinister of the common peasant. For of one blood, after all, are all the nations of the earth, as well as the men that make up these nations.

Origin of the English Character

Another necessary conclusion is this, that race characteristics imply direct personal relationship among those who exhibit them. The Englishmen of to-day are such because they are related by blood. They are the variously intermingled descendants of

some few robust families of a thousand years ago, a hundred thousand of them at the most. "Saxon and Norman and Dane are we." From these families—Dane, Norman, and Saxon—the weak, the infertile, and the unfortunate are constantly undergoing elimination, leaving the strong and fecund to persist. The withered branches are only kept in existence through misplaced charity which continues the pauper, or through bad social conditions which propagate the criminal. Pauperism, criminality, and folly have their lineage, but it is not a long one; and wiser councils will make it shorter than it now is. This persistence of the strong shows itself in the prevalence of the leading qualities in the dominant strains. To these dominant ancestors every line of deviation will be found to lead, when we come to follow it, backward. In following the pedigree of an individual backward for a thousand years, we find that millions of duplications must occur in his ancestry. That is, thousands of persons would be reached from one to a thousand times each in the following up of different ancestral

lines. The growth of colonial types comes from the narrowing of the range of crossing and from intermarriage with lines not English, which occurs most frequently outside of England. This is especially true in the United States. But in a few centuries these same conditions will unite to form a "Brother Jonathan" as definite in qualities and as "set in his ways" as his ancestor, the traditional "John Bull."

And these again are modified, and for the worse, by the reversed selection of war in England which has cut off the strong young men, John Bulls in possibility, and in America by the unrestricted emigration, which has cast us in a melting pot with the alloy of the oppressed of all nations, to our general advantage perhaps, in the first place, but now, it may be, being carried too far.

The Survival of the Existing

Race types thus arise from the "survival of the existing," its best results modified and preserved by the "survival of the fittest." Actual presence in a country of certain ancestral stocks is the first element. Their

characters become workable, durable, and at last "ineradicable" by the survival of those in whom those characters are elements of life.

The Wholesome World

If the heredity of Richard Roe is "unworkable," it cuts off in the end his line of descent. The nation at last is built up by the men who can take care of themselves and have something left over for the common welfare. Strength begets strength and wisdom leads to wisdom. "Progress towards some upward ideal of living among men is the surest fact in history." "There is always room for the man of force, and he makes room for many." It is the strong, wise, and good of the past who have made civilization possible. It is the great human men, the "men in the natural order," that now and for all time determine the current of life. "The earth," Emerson tells us, "is upheld by the veracity of good men. They keep the world wholesome."

"WHAT of the end ?— O, not of your glory,
Not of your wealth or your fame that will live
Half as long as this pellet of dust !—
Out in the night there's an army marching,
Nameless, noteless, empty of glory,
Ready to suffer and die and forgive,
Marching onward in simple trust,

Wearing their poor little toy love-tokens
Under the march of the terrible skies !

. . . . .

Waving their voicelessly grand good-byes,
Secretly trying, sometimes, to pray.

. . . . .

Marching out of the endless ages,
Marching out of the dawn of time,
Endless columns of unknown men,
Endless ranks of the stars o'er-arching,
Endless ranks of an army marching
Numberless out of the numberless ages,
Men out of every race and clime,
Marching steadily, now as then."

Alfred Noyes : "Rank and File."

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